Rock Products

DEVOTED TO

Concrete and Manufactured Building Materials

Vol. VII | CHICAGO, ILL., JANUARY 22, 1908 | No. 7

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We are the largest distributers of Portland Cement, Lime Plaster, Fire-brick and General Building Material in the Southern States, and have stocks of Standard Brands at all of the Atlantic and Gulf Seaports, and at our interior mills and warehouses, for prompt and economical distribution to all Southern territory. Write for our delivered prices anywhere. Also Southern agents for the "Dehydratine's" waterproofing material. "Universal," "Aeme" and "Electroid" Brands Ready Roofing. Get our prices.

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Are digging **Cement Rock without blasting** and loading it on cars for the Burt Portland Cement Co. of Bellevue, Mich., for less than 12 cents per cubic yard, and they are operating the shovels at only half capacity. How much is it costing YOU? Better write today for information.

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DEVOTE a special department to the manufacture of Brick particularly adapted both physically and chemically to

Lime Kiln and Cement Kiln Construction

Large stock carried. Prompt shipments made. Write for quotations on Standard and Special shapes, to

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Northwestern Clay Mfg. Co.

New Windsor, Illinois.

J. O. FREEMAN, Genl. Mgr.

Sewer Pipe

Drain Tile.

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Works: Griffin, Ill.

Ottawa Silica Co.'s Washed White Flint Sand

Is used for sawing stone in more than a dozen states. Cuts more and lasts longer than any other sand on the market. Unexcelled for Roofing, Facing Cement Blocks, White Plaster, etc. Freight rates and prices on application.

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DEXTER Portland Cement THE NEW STANDARD

Sole Agents SAMUEL H. FRENCH & CO. Philadelphia

Phoenix Portland Cement UNEXCELLED FOR ALL USES.

Manufactured by

PHOENIX CEMENT CO.

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FOR GRIFFEN MILLS
FOR TUBE MILLS
FOR BALL MILLS

Chicago Belting Company

MAKERS

67-69 South Canal Street, SEND US YOUR SPECIFICATIONS. CHICAGO, ILL.

ALMA Portland Cement

STANDARD BRAND OF MIDDLE WEST.

Specially Adapted to all Reinforced Concrete and High-Class Work.

Alma Cement Co., WELLSTON, OHIO

Special Features in This Number.

Fourth Convention of National Association of Cement Users at Buffalo.

The Los Angeles Auditorium, Largest and Finest Concrete Structure.

Concrete Blocks Make a Splendid Fire Record at Anderson, Ind.

Fine Equipment of Sand-Producing Plant at Ottawa, Ill.

Comprehensive Reports of All the Technical and Material Conventions of the Month.

Fireproof Structural Tile of Concrete Introduced with Success in Many Markets.

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SUCCESSFULLY USED FOR TEN YEARS IN ALL KINDS OF CONCRETE WORK

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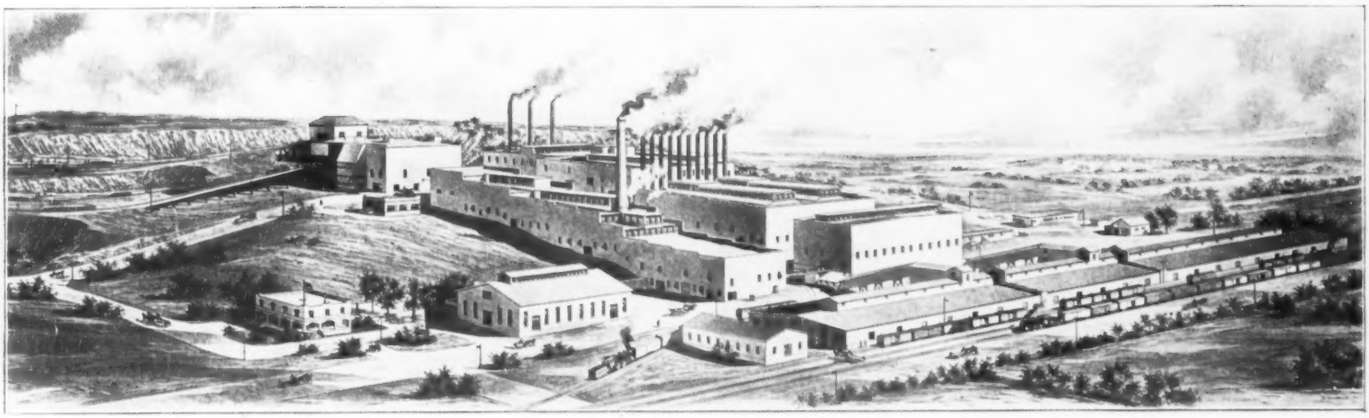


NEW MILL AT INDEPENDENCE, KANSAS.

Two Great Plants,
at IOLA and INDEPENDENCE, KANSAS,
MAKING PERFECT CEMENT,
WITH UNSURPASSED SHIPPING FACILITIES,
GUARANTEE PROMPT SERVICE.

YOUR CEMENT NEEDS CAN BE SUPPLIED EFFICIENTLY.

Write today to

KANSAS PORTLAND CEMENT COMPANY

General Sales Office: IOLA, KANSAS

Rock Products

DEVOTED TO

Concrete and Manufactured Building Materials

Volume VII. CHICAGO, ILL., JANUARY 22, 1908. Number 7.

THE LOS ANGELES AUDITORIUM.

Notable Features of This Triumph of Up-to-Date Concrete Construction.

LOS ANGELES, CAL., Jan. 15.—Even persons quite well informed concerning the really wonderful development of Southern California within the past twenty-five years will, on a visit to Los Angeles, experience much surprise while making a tour of this beautiful city. It is truly a new city, since very little remains of the Los Angeles of Spanish origin, nearly all of the old buildings having been removed in the march of progress.

A feature of the city lies in the fact that almost every State in the Union has contributed to its population, with a goodly percentage of persons of foreign birth, including Mexicans and Japanese. Another marked peculiarity is the enthusiastic interest of its citizenship in plans for improved municipal conditions. Large schemes for public improvements have ready support, as, for instance, the plan for securing from the mountain district an almost unlimited supply of water to supplement the present facilities, for which enterprise the sum of $23,000,000 will, during a series of years, be expended by the city. The office buildings, banks and stores equal in size and splendor those of cities much older and larger. The public buildings also rival those of Eastern cities. All the principal streets have been laid with asphalt and at night are brilliantly lighted by electric lights in clusters of globes on handsome iron posts. The absence of smoke, fog and dust contributes to cleanliness and preserves the buildings from the loss of their architectural beauty.

The street-car service is far superior to that of most American cities. The handsome cars are run with great frequency, and at a speed which surprises the stranger. The total mileage of single track is 250, all electric.

The city has had the good fortune to have had but few labor troubles, and the strike as a means of securing higher wages and shorter hours is systematically discouraged by all the employers of labor.

Building operations are active and going forward on a large scale. The mild climate admits of the construction of all classes of buildings the year through. Manufacturing enterprises are growing apace. Old concerns are enlarging their plants, and new industries are constantly being developed. The attention of the leading citizens is being directed to the still farther enlargement of harbor facilities at San Pedro, both as regards safety and depth, for the accommodation of large deepwater craft.

THE AUDITORIUM, LOS ANGELES, CAL.

While there is considerable activity in real estate, transfers are normal, and none of the "boom" features, which in the past at times operated to the detriment of Los Angeles, are apparent. The assessed valuation of property in the city is over $200,000,000.

Conditions in the building supply line were found to differ considerably from those in other sections. Sewer pipe is mostly handled by the hardware dealers. Sand is procured locally; crushed granite from the near-by mountains. Cement plaster is popular with the plasterers, as they don't have to wait for it to slake. A large amount of the Portland cement used was until recently imported from Germany, but the Kansas product is now reaching this market in growing quantities, the Sunflower brand especially leading among the American brands which are superseding the imported article.

It is claimed that concrete for building construction has been more extensively used in Los Angeles than in any other city in the United States. This is partly due to its demonstrated ability to resist earthquake shocks, and partly to its cheapness, as compared with other building materials in the vicinity.

One of the most remarkable concrete structures put up in the country is the great Auditorium Building recently opened in Los Angeles with a season of grand opera. It is the largest reinforced concrete structure of its kind in the world (being absolutely fireproof), and incloses three modern auditoriums, with a combined seating capacity of 7,000, one being the largest and most magnificent on the Pacific Coast, and containing one of the largest and finest pipe organs in the world. The building also incloses a banquet hall, seating 1,000 people; 150 business offices, and six storerooms. In addition to its immense size this building is notable in several respects. It has three features that are new in reinforced concrete construction. These are a complete concrete roof construction, an immense balcony overhang, and cement girders constructed to support extraordinary loads.

The overhang of the balcony is 31 feet. In the concrete roof construction are placed enormous trusses, 112 feet in height, with a depth in the center of 11 feet. Here a considerable deflection was looked for when the time came to remove the supporting falsework, yet it proved so slight as not to be noticeable, and could not be accurately measured. This

Continued on page 52.

NORTHAMPTON PORTLAND CEMENT COMPANY

Strength
Durability
Permanence

Not only laboratory tests, but results in actual work prove the high grade quality of

Northampton
Portland Cement

Especially adapted for Cement Blocks, Sidewalks, and all forms of concrete and re-inforced concrete construction.

Northampton Portland Cement Co.

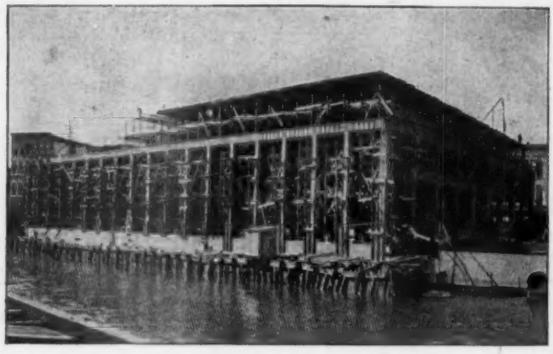
Main Office and Works
Stockertown, Pa.

WHITE PORTLAND CEMENT — SANDUSKY PORTLAND CEMENT CO. — SANDUSKY OHIO — STAINLESS.

Medusa Water-Proof Compound

Makes all Concrete Watertight

The foundations and floor in basement, all of cement, in the Bostwick-Braun warehouse, Toledo, O., here illustrated, contain Medusa. Write for pamphlet describing its use.



Write for samples of our Pure White Portland Cement.
Do not accept a substitute, as there are many adulterated compounds on the market.

Sandusky Portland Cement Co.

SANDUSKY, OHIO

WHY?
Egyptian Portland Cement

Every mason likes it.
Works easy.
Excellent color.
High in tensile strength.
Fine ground.
Mill centrally located.
Low freight rates.
Popular price.

We can save you money — Write us your needs

THE BARTLETT CO.

Mills: Fenton, Mich. — Sales Office, Jackson, Mich.

WOLVERINE PORTLAND CEMENT CO. — WOLVERINE — PORTLAND CEMENT — GENERAL OFFICES, COLDWATER, MICH., U.S.A.

Strength
Uniformity
Satisfaction

A Dependable Portland Cement

An Unblemished Record for six years speaks for itself

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Pennsylvania Portland

UNEQUALLED FOR HIGH CLASS CONCRETE WORK

Pennsylvania Cement Co.

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Peninsular Portland Cement

TRADE-MARK

Acknowledged by competent Architects and Engineers to be unequaled for fineness, wonderful development of strength and sand carrying capacity.

"THE BEST IS THE CHEAPEST"

Address
Peninsular Portland Cement Co.
Jackson, Michigan

THE FOUNDATIONS OF THE NAVY ARE LAID IN

NAZARETH PORTLAND CEMENT

NAZARETH FURNISHED BY BENSON, PHILLIPS & COMPANY, NEWPORT NEWS, VA., FOR THE FOLLOWING SHIPS' BOTTOMS:

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Missouri	North Carolina
Louisiana	Montana
Minnesota	MONITORS
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High Tensile Strength, Finely Ground, Light and Uniform in Color.

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Write for Catalogue. Capacity, 8,000,000 Yearly.

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Manufacturers: Sales Office, Holland Building. St. Louis.

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Manufacturers of the celebrated "Buckeye" brand of

Portland Cement

"Buckeye" has stood the wear and tear in many important places for the past fifteen years and under the new process of manufacture is now better than ever.

WE INVITE YOUR CORRESPONDENCE. Bellefontaine, Ohio.

ONE GRADE—ONE BRAND

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The Recognized Standard American Brand.

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MANUFACTURER OF . . .

"CHICAGO AA" PORTLAND CEMENT.

We make one brand only. The best that can be made.

HYDRATED PORTLAND LIME

IS IDEAL FOR

Waterproofing Concrete Blocks

SAVES MONEY. TRY IT.

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CHICKAMAUGA CEMENT CO.,

Sole Manufacturers. CHATTANOOGA, TENNESSEE

Tell 'em you saw it in ROCK PRODUCTS.

High Tensile Strength
Light Uniform Color
Finely Ground

CASTALIA PORTLAND CEMENT CO.
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PLANT:
CASTALIA, ERIE CO., OHIO.
CAPACITY:
2,000 BARRELS DAILY.

CHARLES L. JOHNSON, Sales Mgr.
CASTALIA, OHIO

Newaygo Portland Cement Co.

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Write us for prices. Send us your orders.

CAPACITY 700,000 BARRELS ANNUALLY

OFFICE ALLENTOWN, PA.

STANDARD SPECIFICATIONS GUARANTEED

The Ironton Portland Cement Co.

Manufacturers of the

Celebrated Limestone Brand of Portland Cement

Used by the Railroads in Kentucky, Ohio, West Virginia and Virginia during the past five years.

Cement as finely ground as any on the market.

Guaranteed to pass all the standard specifications.

Plant located at Ironton, O., within easy access to seven States, namely, Ohio, Indiana, Kentucky, West Virginia, Virginia, Tennessee and North Carolina.

Shipments via the N. & W. Ry., C. & O. Ry., C. H. & D. Ry., D. T. & I. Ry., or Ohio River.

Write for prices

The Ironton Portland Cement Co.
IRONTON, OHIO

EDISON
Portland Cement Co.

85 per cent. thru 200
98 per cent. thru 100

The Finest Ground Portland Cement Manufactured

"Neat tests are of less value than those of the briquettes made with sand and cement. **The fineness of the cement is important, for the finer it is the more sand can be used with it.**"
[Abstract from "Specifications for Portland Cement," issued by the United States Navy Department, June 12, 1905.]

FINE GRINDING
OF
PORTLAND CEMENT
AND WHAT IT MEANS

For a proper understanding and full appreciation of the importance of fine grinding, it is necessary to explain that Portland Cement (as manufactured in the Lehigh Valley) is made from what is commonly understood as "Cement Rock," with the addition of sufficient limestone to give the necessary amount of lime. The rock is broken down and then ground to a fineness of 80 per cent to 90 per cent through a 200 mesh screen. This ground material passes through kilns and comes out in clinker. This is ground and **that part of this finely ground clinker that will pass a 200 mesh screen is cement;** the residue is still clinker. These coarse particles or clinkers will absorb water very slowly, are practically inert, and have very feeble cementing properties. **The residue on a 100 mesh screen is useless.**

Edison Portland Cement is ground 85 per cent through a 200 mesh screen,—10 per cent finer than other brands. This can be verified in any laboratory.

In a barrel of Edison Portland Cement, therefore, you get 85 per cent of Portland Cement and 15 per cent of clinker. In a barrel of other brands you get 75 per cent of cement and 25 per cent of clinker.

If you are buying a ton of coal, would you buy the coal containing 25 per cent of slate, or would you prefer the coal containing but 15 per cent of slate?

If, instead, you are buying iron ore, would you not give preference to ore that contained 10 per cent more units of iron?

Another point is worth considering and that is that the Edison Portland Cement Company make but one brand or quality, and that is the best.

SALES OFFICES:

St. James Building, New York. Union Building, Newark, N. J.
Arcade Building, Philadelphia. Post Office Square Bldg., Boston, Mass.
Machesney Building, Pittsburgh. National Bank Bldg., Savannah, Ga.

CEMENT IN THE WEST.

Kansas Leads, and the New Bonner Springs, Kansas, Plant will be the Most Modern in the World.

IF CEMENT is to supersede steel to any appreciable extent in the present constructive era, then it is patent that the West is rapidly assuming a leadership in the industrial world whose history vies romance with that of the great iron interests of the East, for the Western states have suddenly awakened to the infinite importance of the utilization of their vast resources for the manufacture of Portland Cement, and gigantic strides are being made in the practical pursuit of a most profitable industry.

Today, the iron master of the East finds his parallel in the Concrete King of the West, while the fiery furnaces of Pittsburg are no more remarkable than the ponderous rock-crushers of a modern Kansas Cement Plant.

Two conditions ideally combine to make Kansas and Missouri the maximum producing district of both hemispheres; the possession of a very superior quality of material-in-the-rough, which is not only more accessible than any heretofore discovered but which requires only minimum cost in its preparation—and secondly, the existence, in immeasurable quantities, of that mysterious and superior fuel, Natural Gas.

There is practically no cost whatsoever attached to the use of Natural Gas, and as fuel is one of the principal items of expense in the manufacture of Cement and for the further reason that the limestone and rock of this district requires little or no stripping, and when blasted, fracture along horizontal lines, the Kansas-Missouri manufacturer of Portland Cement finds his cost of production reduced to just half the ordinary expense, and his profits, therefore, doubly large. But these facts alone do not constitute the Western manufacturer's only motive for industriously engaging in the manufacture of the product; the unsatisfied and fast-increasing demand in his own territory for Concrete gives him an additional advantage in competing with the Eastern producer who is forced to market his product in the West at advanced prices due, in turn to heavy freight charges and excessive cost of production. Yet, in spite of this, the West has, for some years past, gone East for 5,500,000 barrels of Portland Cement annually. So that this persistent Cement famine has given fresh impetus to the West with the fine result that the Kansas-Missouri district now boasts an even half-dozen splendid plants which contribute equally with the Eastern plants in supplying the 11,000,000 barrels that constitute the yearly consumption of the Western states.

MR. W. H. CAFFERY,
Founder of the "Caffery System."

Of these six plants, the two finest examples are the recently completed Kansas City Portland Cement Company's 2,000 barrel plant at Independence, Mo., and the Bonner Portland Cement Company's modern 2,500 *barrel plant now in course of completion at Bonner Springs, Kan.*, both plants being less than sixteen miles distant from Kansas City. The latter-named is probably the most remarkable Cement property in the West, while both companies owe their existence to W. H. Caffery, in whom the West has its chief exponent of the Cement industry —a genius and the born leader of those sturdy pioneers who have blazed the way to the founding of a great Cement Empire beyond the Mississippi. And here, the finely-developed intellect of Mr. Caffery, together with his unrelaxing purpose and untiring effort, call for more than a passing appreciation of this Master Builder, who, long before the present century had entered upon its course, dreamed of a great kingdom—a principality of inconceivable wealth, wherein those monster forces, Fire and Water, might be so chained and harnessed as to create a something worth while out of nature's crude resources. For Mr. Caffery even then had visions of an Age of Concrete in the West.

His first efforts, as exerted in the promotion of the Kansas City Portland Cement Company, were attended with extreme difficulties and stern obstacles on every hand, but he continued undaunted in his purpose. The West knew little or nothing about Concrete manufacture; cared less. The Kansas investor had money for mining investment, but not even encouragement for anything quite so unknown and speculative as Cement. Stocks, bonds, real estate, etc., were securities highly esteemed by the man from Missouri, but this Cement problem was one of many ramifications, while the fact that it offered seven, eight, ten and even twenty per cent immediately outlawed it as a legitimate investment in the bankers' eyes. So that credit was extended the new Cement Company very reluctantly indeed, and wise investors were cautioned by financial sages against taking on any considerable amount of Cement stock. In spite of these misgivings and prejudices, the unflinching determination of Mr. Caffery succeeded in doing the impossible, however, and the new Cement Plant became a reality and an object of pride to every loyal Missourian.

Meanwhile, Mr. Caffery was not content to rest on his laurels, but began, instead, the inception of a new proposition on a much more ambitious scale. As a result, the Bonner Portland Cement Company of Bonner Springs, Kan., was launched with a capitalization of $2,000,000. This transpired on the *ninth day of March* of the past year. Forty days thereafter, the prospectus and literature of the new concern was off the press and the first offering of stock was made. The story of the success of the Bonner Company is best told in the words of the *Kansas City Post* of July 20th, 1907:

"Within ninety days, this company (referring to the Bonner Company) has completed its organization, practically closed out all of its stock, bought, contracted and paid for its entire immense equipment of machinery and vigorously entered upon the construction of its plant."

In four months intervening between this writing and the publication of the excerpt above referred to, the bulk of construction work on the new Bonner Plant has been completed. Aside from the actual building of the handsome all concrete office building, together with the completion of several of the more important buildings, considerable machinery has already been installed, while more is arriving daily.

Mr. Caffery confidently expects to have the plant in operation not later than January 31st next, and hopes to be filling orders for "Bonner Brand" Cement during the first week of February. If these expectations are realized Mr. Caffery will have achieved a world's record in the act of organizing, financing and building one of the finest modern cement properties in existence within less than one year's time.

CEMENT COAL

MOST SUCCESSFUL AND PROFITABLE FEUL EVER USED BY CEMENT MANUFACTURERS.

Our Long List of Customers do Our Quality Talking

NOW IS THE RIGHT TIME TO BUY COAL TO THE BEST ADVANTAGE.

WRITE QUICK TO

FAIRMONT COAL COMPANY

EDWARD M. MANCOURT
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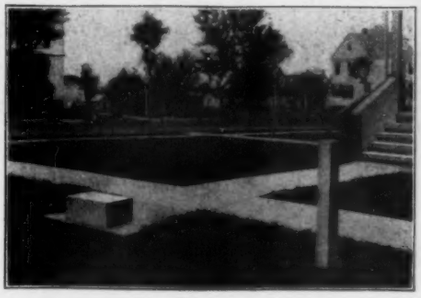
Tell 'em you saw it in ROCK PRODUCTS.



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FOR FARM

From "Reinforced Concrete in Factory Construction."

FOR FACTORY

From "Concrete Country Residences."

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Concrete Construction is the Best

It is Economical, Durable, Fireproof and Sanitary; Needs No Paint or Repairs; is Warmer in Winter, Cooler in Summer Than Any Kind of Construction and is Adaptable to Any Style of Architecture.

For the benefit of those who desire to make lasting improvements about the FACTORY, FARM OR HOME, and as a guide to those who contemplate new construction, we have published the following books:

For the Suburbanite and Farmer.

"CONCRETE CONSTRUCTION ABOUT THE HOME AND ON THE FARM."

A book containing directions for making and handling concrete, also many specifications, sections drawings, and photographs of the smaller constructions that can be built by the layman without skilled labor.

Paper bound copies free upon request
Cloth bound copies 25 cents each.

For the Manufacturer and Merchant.

"REINFORCED CONCRETE IN FACTORY CONSTRUCTION."

A book containing besides several general chapters on concrete, concrete aggregates, methods and materials for reinforcing—ten chapters giving detailed descriptions of ten concrete factories and warehouses erected in various parts of the country by different systems, with photos, sectional drawings and specifications furnished by the engineers in charge of the work.

This book profusely illustrated (250 pages, size 6¼x9), pamphlet bound, sent free upon request to Architects, Engineers and Manufacturers who contemplate building.

Cloth bound copies 50 cents each.

For the Mechanic and Artisan.

"CONCRETE COTTAGES."

A sixteen page pamphlet showing photographs, floor plans and specifications for small concrete houses ranging in cost from $1,500.00 to $4,000.00.

Copies sent free upon request.

For the Home Builder and Investor.

"CONCRETE COUNTRY RESIDENCES."

A book containing photographs and floor plans of over 150 Concrete Houses, ranging in price from $2,000.00 to $200,000.00. The houses not only show a large variety of design, but are of several different systems of concrete construction. These are not imaginary sketches, but houses already built and designed by the best architects in the country.

Copies (168 pages, size 10x12), will be sent express prepaid upon receipt of $1.00.

THE ATLAS PORTLAND CEMENT COMPANY

DEPT. U, 30 BROAD STREET, NEW YORK

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"SUPERIOR"

Before you buy your Cement for 1908.

Every Barrel gives entire satisfaction.

Write Us for Prices and Tests

Guaranteed to meet the requirements of "Standard Specifications."

The Superior Portland Cement Co.

Works:
Superior, Lawrence Co., Ohio.
Detroit, Toledo & Ironton Ry., within switching distance of C. & O. and N. & W. Rys.

General Offices and Sales Dept.,
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"KOSMOS"

Kosmos Portland Cement is the product of a model plant, using high grade raw materials and under the direction of a staff of experienced cement engineers.

It is guaranteed the equal of any American Brand of Portland Cement and will be found to run uniform in color, strength and fineness. It is suitable for any class of work and is especially recommended where the requirements are exacting.

Manufactured by the

Kosmos Portland Cement Co., Inc.

BUSINESS OFFICE: 614-616 Paul Jones Bldg., Louisville, Ky. **WORKS: Kosmosdale, Jefferson Co., Ky.**

Hydratite

Added to *Cement*
Makes it *Waterproof*

Dehydratines

Waterproofing Compounds.
Made in Grades to Answer
Every Requirement in the
Waterproofing of Structures

Symentrex

(Liquid Concrete)

Perfect Finish for *Concrete*
and all Masonry Surfaces

Water-Resisting — Artistic —
Durable

A. C. Horn Company

Waterproofing Engineers and Manufacturers of Structural Waterproofing Compounds

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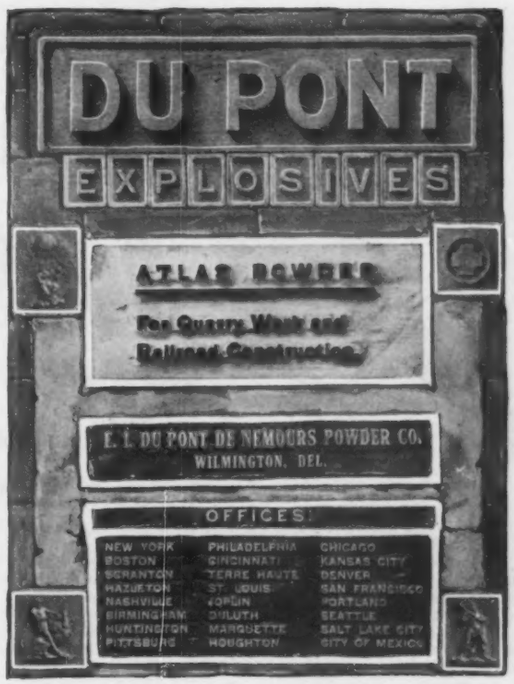

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Jamestown, - Mercer Co., Pa.

Manufacturers of high grade mortar colors. All shades, both dry and pulp

Original and only manufacturers of the celebrated

DOUBLE STRENGTH DRY BLACK

the only **Black** black on the market.

We can demonstrate merit.

Correspondence solicited. Ask the price.

The

COLOR

That Never Fades.

Tried out for 20 years. For Mortar, Brick, Cement, Stone, etc. Red, Brown, Buff, Purple and Black.

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SAVES YOUR MONEY

Amatite is a ready roofing of superior durability with a mineral surface requiring no paint or coating.

There is the whole story of Amatite in a nutshell.

Its low price combined with the fact that it requires no paint makes Amatite the *most economical ready roofing on the market.* Other roofings require constant attention and care. Failure to paint regularly means a leaky roof. If you count the cost of this periodical painting and add it to the first cost of these roofings, the total makes Amatite seem cheap indeed.

The first cost of Amatite is the only cost. The first cost of the "paint-me-quick-or-I'll-leak" roofings is only the beginning.

There is nothing flimsy about Amatite. It is made to last. There is twice as much material in it as there is in most roofings—the weight of a roll tells that. It is easy to lay, requiring no skilled labor or special tools. Investigate the facts. They are in our new, free booklet. We send it free with sample of Amatite. Write at once.

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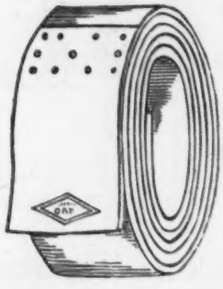
Barrett Manufacturing Company

New Orleans Kansas City Cincinnati St. Louis Boston London, Eng.

For durability and satisfaction you can depend on Rhoads Belts in cement mill work

J. E. RHOADS & SONS



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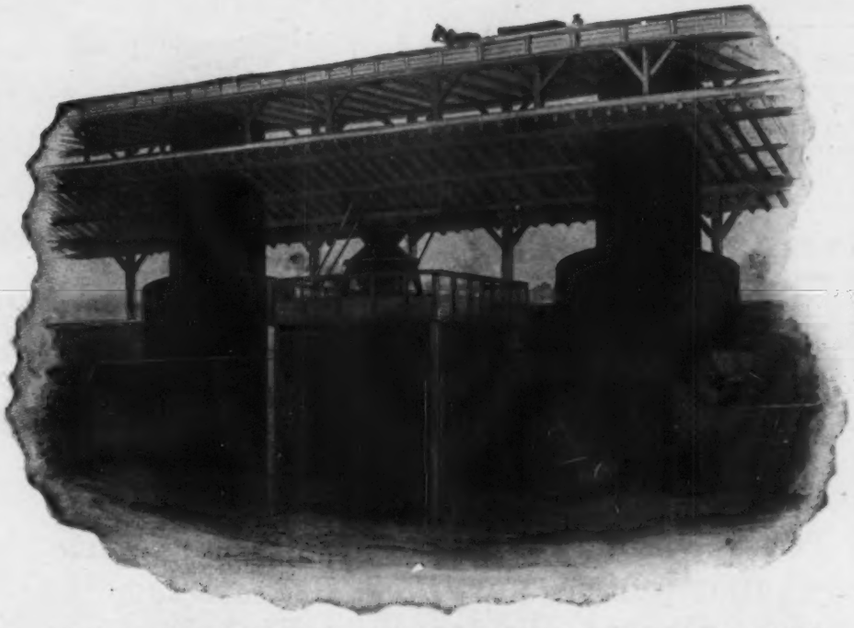
PRODUCER GAS Makes the Best Lime It increases the Capacity of a Plant and Reduces the Fuel Bill



The Total Cost of This Installation Will be Paid for by the Saving Effected During the First Year of Operation

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Cement Mill Machinery

FOR EITHER WET OR DRY METHOD OF MANUFACTURE

CRUSHERS—DRYERS—KILNS—COOLERS
TUBE MILLS—BALL TUBE MILLS, ETC.

Our Ball-Tube Mill shown above is a distinct innovation in the line of cement-making machinery, and is destined to entirely replace the old-time ball mill for the coarse grinding of cement clinker, because of its much greater grinding capacity per horse-power and the extremely low cost for repairs.

NO SCREENS TO CLOG OR WEAR OUT
THEREFORE NO SHUT-DOWNS

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CUDAHY (Suburb of Milwaukee) WISCONSIN

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MANGANESE STEEL

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Power Conveying Parts,—Gears, Sprockets, Sheaves, Detachable Link Belting.

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The "Panama" Two-Part Dipper Tooth for Steam Shovels and Dredges.

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Castings for parts that receive the shock—which MUST be machined.

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"The Svenson is Easily the Simplest and Fastest Mixer Ever Built"

Quit wasting money and making bad concrete with that "batch" machine. Don't fuss and lose time with complicated mixers. Let us tell you about this simple, strong machine.

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The Svenson Concrete Mixer

Has only five moving parts, all on one shaft. It keeps going and it keeps the men going.

We want to tell you our ideas on proper mixing, for the "Svenson" mixes dry, then wet—the only scientific way. And it proportions the mix positively, just the way you set it.

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Ohio White Finishing Lime, Ground Lime, Lump Lime, Fertilizer, Hydrate Lime, Cement, Plaster, Hair, Etc., Etc.

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Cheshire finishing lime, which is well known and always A 1.
Bellefonte Lime, a highly caustic chemical lime, and a large yielder for brick work, making a bond almost equal to cement mortar.
Palmer select finishing, fully guaranteed.
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Palmer Chemical Lime, which has a universal reputation, analyzing over 99 per cent Pure Carbonate.
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When selling you an equipment our staff of specialists know what kind to avoid, as well as to use, for the successful treatment of your lime. This knowledge is at the disposal of our customers.

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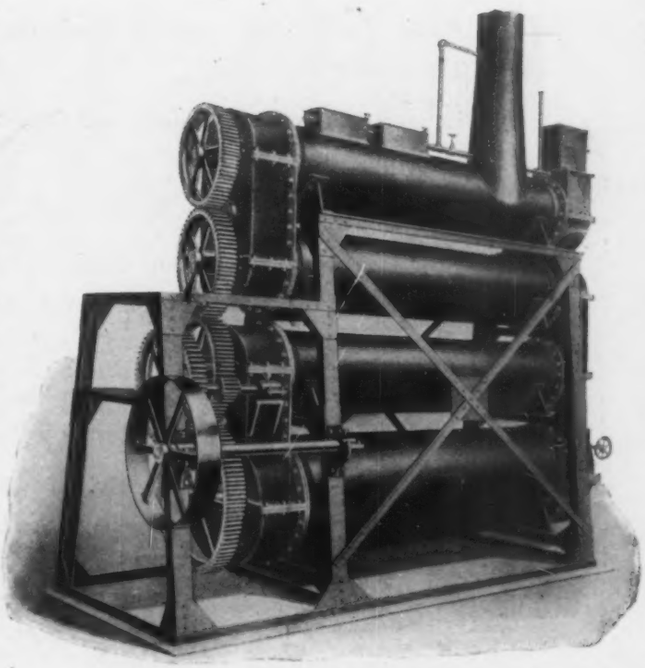

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Rockland-Rockport Lime-Quality

For over a century Rockland-Rockport Lime in the building trade has been known as the STANDARD. This has been made possible by the fact that the Rockland-Rockport quarries are the best in the country; that the equipment is modern and that care is taken in the manufacture.

For the Mason—great sand capacity producing a rich mortar with great spreading properties. More bricks laid.

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Brown—sand capacity—immense. A rich mortar of great strength.

Finishing—the ideal lime. Does not shrink in stiffening. Requires less plaster and troweling, thus reducing the danger of fire cracking. A strong white finish that is without a blemish.

Rockland-Rockport Lime is the strongest on the market and in every barrel there is a saving of material and labor with better work accomplished.

Rockland-Rockport Lime is packed in the following guaranteed sizes:

Common 220 and 320 lbs. per barrel. Blue labeled.

Finishing 200 and 350 lbs. per barrel. Red labeled.

For the dealer, Rockland-Rockport Lime is the best to handle, giving more satisfaction to the trade than any other lime.

Rockland-Rockport Quality plus Quantity, equals Economy.

Rockland-Rockport Lime Co.

New York
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Rockland, Maine

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MANUFACTURERS OF THE LIME OF QUALITY. ESTABLISHED OVER A CENTURY

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Send me information on Rockland-Rockport Lime.

Name_____

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Tell 'em you saw it in ROCK PRODUCTS.

THE WOODVILLE WHITE LIME COMPANY
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Largest Capacity of Hydrated Lime in the U. S.

Sales Agents **EDISON PORTLAND CEMENT**

Manufacturers of and Wholesale Dealers in

Lime, Lumber, Sewer Pipe and a Full Line of Builders Supplies.

OUR HIGH GRADE PRODUCTS

White Enamel Finish
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Lined with Our BAUXITE Lining Blocks

In hot zone and our special fire-clay blocks throughout the rest of Kiln can be run from three to four times as long as Kilns lined with the very best fire-clay linings. Write for booklet describing Bauxite Linings for Portland Cement Rotary Kilns.

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Sewer Pipe, Wall Coping, Hollow Tile
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"IF IT IS **LIME** WE MAKE IT."

Lump - Barreled - Hydrated Ground.

STRONGEST IN OHIO.

We are not connected with any Trust or Combination.

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PHONE US **The Scioto Lime and Stone Company, Delaware, Ohio**

Farnam "Cheshire" Lime Co.

OF CHESHIRE, MASS.
MANUFACTURERS OF THE

Celebrated "Cheshire" Finishing Lime.

Well known throughout New York and the Eastern States as the finest finishing lime manufactured. The special feature of this lime is its quick and even slacking, thus preventing any cracking or checking when put on the wall. It is the best lime used in the country today for all

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The sand capacity is immense. Produces a rich mortar with great spreading qualities. A saving of labor and material. Sold by all the best building material dealers.

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Manufacturers of
Sewer Pipe, Flue Linings, Chimney Tops, Fire Brick, Grate Tile, Ground Fire Clay, Wall Coping, Etc.
UHRICHSVILLE, .. OHIO

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For Cement Works, Lime Kilns, Cupolas, Steel and Iron Works of every description

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Hand Made ═══ Hard Burnt

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WILL NOT SLACK. ALWAYS READY FOR USE.

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A PRODUCT OF MERIT.

The best prepared Lime in the market. Is superior to hot Lime for all purposes. Will not deteriorate. Absolutely pure and free from foreign ingredients. Successfully used for years by the largest users of Hydrate in the country.

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Try us on your Portland Cement requirements

The

Strongest White Lime

ON THE MARKET

Uniform Quality **Finest Grain**

The American Clay Machinery Co.
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May 16, 1906.

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Mitchell, Ind.

Dear Sirs:-

Replying further to your favor of the 8th inst requesting us to advise you the result of practical test of your lime in the manufacture of sand-lime brick. We are pleased to advise you that the lime hydrated easily and the brick made from it were first-class in every respect.

We have forwarded some samples of it to Mr. Elkus of the Indianapolis Composite Brick Co. and he can probably advise you further.

Very truly yours,
The American Clay Machinery Co.
by W. J. Burke.

MITCHELL LIME COMPANY

MITCHELL, INDIANA

THE OHIO AND WESTERN LIME CO.

HUNTINGTON, INDIANA
MANUFACTURERS OF

LUMP LIME

ALSO, DIAMOND BRAND SUPERIOR WHITE FINISH

A HYDRATED LIME

AND A GROUND AND FERTILIZER LIME

Capacity 4,000 barrels or 10,000 bushels per day. Capacity of Hydrated Lime, 120 tons per day. Our LUMP LIME as well as our HYDRATED LIME is the very best obtainable for all purposes for which a good lime is needed in erecting buildings. Our HYDRATED LIME is absolutely the best finishing lime on the market.

FOWLER & PAY,

Brown Hydraulic Lime, Austin Hydraulic Cement, Jasper Wall Plaster, Brick. Stone.

CEMENT WORKS: Austin, Minn.
PLASTER MILL: Ft. Dodge, Iowa.
WAREHOUSE: Minnesota Transfer.

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ASH GROVE
WHITE LIME ASSOCIATION
MANUFACTURERS OF
High Grade White Lime.
KANSAS CITY, MISSOURI.

The Kelley Island Lime and Transport Co.

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Tiger Brand White Rock Finish the best known and smoothest working Hydrated Lime manufactured.

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THE LARGEST LIME MANUFACTURERS IN THE WORLD.

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MANUFACTURERS OF

CRUSHED STONE AND WHITE LIME

TOTAL CAPACITY CRUSHED STONE 4000 TONS DAILY.

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For Building

MONOLITHIC HOLLOW WALLS

Leased to Contractors on Low Royalty

Hollow Walls

With HAM'S METHOD Steel Forms the truly hollow wall is easily made. It is, in fact, a hollow wall, being two separate Monolith Walls built simultaneously and tied together every 15 inches, both vertically and horizontally, with iron or copper ties.

The Air Space may be made any width from 2 inches up.

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Thickness may be varied from one inch up.

Different materials may be used in each wall, thus insuring that in the construction the utmost economy is secured.

Thus the outer wall may be cement, gravel and sand, and the inner wall of cement, sand and cinders. In this way assurance is "made doubly sure" in the matter of absolute dryness.

ADJUSTABLE
COLLAPSIBLE
INTERCHANGEABLE

Fill Every Requirement

We are ready to prove that

Ham's Method is a building success

Fully protected by Patents—Feb. 26, '07; April 2, '07; Nov. 12, '07

Finish

With HAM'S METHOD Steel Forms, any finish is quickly, perfectly and cheaply made. Either or both of the surfaces can be made as smooth as glass and need no extra work to complete them, other than a coat of Kalsomine, Paint or Neat Cement.

By using the Mortar Beads, which are cheaply and quickly attached, a perfect cut stone face is made. The brick face is similarly made. The beautiful and artistic pebble face is easily produced, and with results not obtainable by any other means.

The Tile Wall is one of the greatest improvements of the age. All sizes of Tile, or of Ceramic Mosaic, are placed on the face while the wall is being poured for Ten Per Cent of the present cost of hand work, and really form a part of the wall and not merely a facing.

Write us to-day

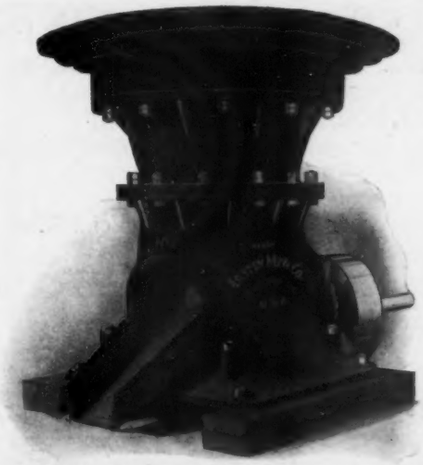
TO THE HOME BUILDER
Seven points to consider

First.—That Concrete properly constructed makes the dryest house that can be built.
Second.—That it can be made beautiful and artistic.
Third.—That it is indestructible and a house built for yourself will make a comfortable home for your grandchildren.
Fourth.—That it is the coolest in summer, and, (at less cost for fuel), the warmest in winter.
Fifth.—That Fire Insurance is unnecessary.
Sixth.—That it never needs repairs.
Seventh.—That it is much the cheapest in dollars and cents.

No Patents for sale

Monolithic Hollow Wall Co.

Monolith Building, New York



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The Only Automatically Lubricated Gyratory Crusher

8 Sizes—Capacities 40 to 2000 Tons.

Simple Construction (Saving Repairs)
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Result: EFFECTIVE, DURABLE AND MAXIMUM CAPACITY.

Plans and Specifications Submitted for Any Size Plant.
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OF EVERY TYPE
CONSTRUCTED FOR ALL PURPOSES.
AGENTS FOR BISHOP WATER JACKETED FURNACE FRONTS
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Industrial Plants

We manufacture machinery for transmitting power, and for elevating and conveying materials in and about cement plants, rock-crushing plants, lime plants, mortar works, plaster works, and other industries.

We manufacture screw conveyors, belt conveyors, and all sorts of chain and cable conveyors, for handling rock, lime, sand, etc.

We manufacture elevators, also, for handling the same kinds of material.

Our lines include shafting, couplings, bearings, collars, pulleys, gears, rope sheaves, sprocket wheels, elevator buckets and bolts, steel elevator casings, etc.

We have our own foundry, sheet metal department and machine shop. We employ first-class help in all departments and use high-grade materials.

When you are in need of anything in our line, try us.

Catalogue No. 28.

H. W. Caldwell & Son Co.
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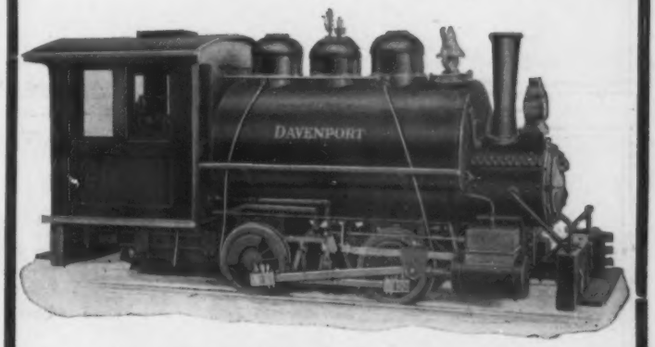
Do You Have Cars to Haul?

The Davenport Locomotive Will Save Money



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Any Size, Any Gauge, Any Weight
Write for Prices and Particulars

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Timber Hangers

ANCHOR STRAPS

For Wood, Steel or Concrete Construction. Special Hangers to suit any conditions.

CHAS. MULVEY MFG. CO.
17 to 21 South Jefferson Street, :: CHICAGO, ILL.

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National Mortar & Supply Co.

A. H. Lauman, President

No. 209 Ninth St., Pittsburg, Pa.

PATENT SOAPSTONE FINISH

PLAIN AND IN COLORS FOR WALLS AND CEILINGS]

Patent Soapstone Mortar

Prepared in any Color for Laying Pressed and Enameled Brick, Stone Fronts, Terra Cotta, Chimneys, Fire Places, Etc.

The Dodge Blackboard Material or Artificial Slate.

The Potter Blackboard Material.

SOAPSTONE MICA. CONCRETE DRESSING. CRUSHED, GROUND AND BOLTED SOAPSTONE.

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Red, Brown, Buff and Black

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Our Metallic Paints and Mortar Colors are unsurpassed in strength, fineness, and body, durability, covering power and permanency of color. Write for samples and quotations.

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Chattanooga, Tenneesee

Clean White Sand

Just the right thing for molding artistic concrete work of all kinds. Pure silica as white as snow that will produce a white product for ornamental exterior and interior concrete finish. The perfectly practical facing material that has never been obtainable before. Quantity unlimited, price reasonable.

SHIPPING FACILITIES UNSURPASSED.

Ballou's White Sand Company

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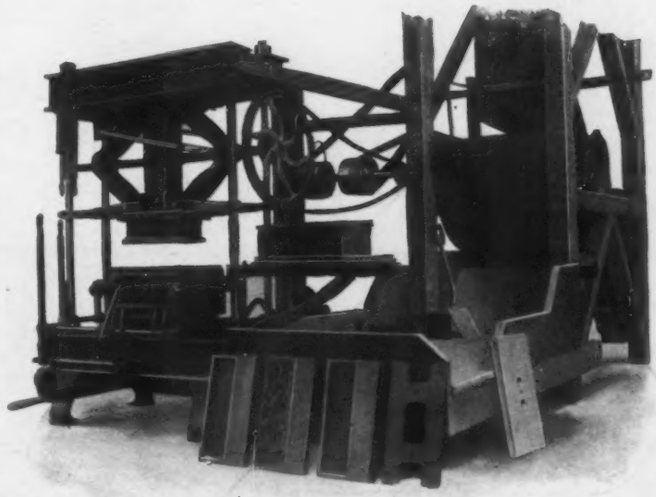
PERFECTION AT LAST ATTAINED IN THE CONCRETE BLOCK INDUSTRY

THE PERFECTION POWER BLOCK MACHINE is the only Power Block Machine on the market, making a Hollow Concrete Building Block under Heavy Pressure and at Great Speed.

Machines have been in constant use since July 1st, 1905, with practically no expense for repairs.

The machine handles sand, gravel, crushed rock, slag and coloring materials perfectly.

All materials accurately measured, thoroughly mixed and uniformly pressed under 200,000 pounds pressure.



Makes 8, 9 and 12x8x24 inch blocks in five faces, and fractional and angle blocks.

Machine can be arranged to make **Two Piece** and **Faced** Blocks if desired.

All machines delivered, set up and put in operation to show a guaranteed capacity of 60 blocks (12x8x24 inch) per hour with 5 men.

Blocks perfectly cured in 24 hours in Vapor Curing Kilns of our own design.

Full details, catalog, testimonials, etc., sent upon request.

THE PERFECTION BLOCK MACHINE CO.

KASOTA BUILDING :: MINNEAPOLIS, MINN.

KOEHRING

When you buy a mixer see that it is a **KOEHRING,** the mixer that can be relied on for

PERFECT MIXED CONCRETE AND DURABILITY

MADE WITH

Double Gear Drive

of Heavy Pattern

Steel Pinions

All Wearing Parts are made EXTRA HEAVY

Runway Rollers are CHILLED and of Large Pattern

Write for Catalogue "F"

Quick Discharge

No Spilling

Lowest Charging Chute

Has Cast Iron Heads and Heavy Steel Shell

Mixes Concrete at Less Cost than any other Mixer

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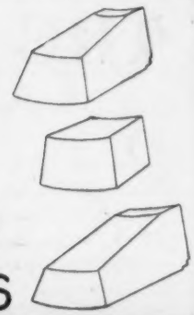
ASHLAND FIRE BRICK CO.
ASHLAND, KY.

IRONTON CROWN.



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GROUND CLAY FOR WALL PLASTER AND BOILER SETTINGS

DIRECT HEAT

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—FOR—

BANK SAND
GLASS SAND
ROCK, CLAY
COAL, ETC.

All Mineral, Animal and Vegetable Matter.

We have equipped the largest plants in existence and our dryers are operating in all parts of the world. Write for list of installations and catalogue S. C.

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DRYERS

RUGGLES-COLES ENGINEERING CO.
NEW YORK CHICAGO

Cummer Dryers

See Other Ad. Page 90

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BRICK and MORTAR **COLORING**

After twenty years "CLINTON" colors still stand at the head. Get the genuine, with the "Little Yellow Side-Label."
CORRESPONDENCE SOLICITED.

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PAPER BAGS & TWINES.
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The Largest Manufacturers in the U. S.
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COLORING
OF ALL SHADES
CORRESPONDENCE SOLICITED. SAMPLES AND ESTIMATES CHEERFULLY FURNISHED ON APPLICATION.

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ALTOONA, PENNSYLVANIA
Designers and Builders of the
SHOOP IMPROVED PATENT LIME KILNS.
Designing and Installing a Specialty.

Lime Kilns and Plant of Blair Limestone Co., Canoe Creek, Pa.
Designed by
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DEVOTED TO CONCRETE AND MANUFACTURED BUILDING MATERIALS.

Volume VII. **CHICAGO, JANUARY 22, 1908.** **Number 7.**

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Seventh Floor Ellsworth Bldg., 355 Dearborn St., Chicago, Ill., U. S. A.
Telephone Harrison 4960.

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CURTAIL PRODUCTION RATHER THAN BUY TRADE.

Too much red tape turns customers away from the front door.

Uniform prices make it easier for the dealer and contractor to do business.

If American gypsum products can be sold in New Zealand, why not on the continent?

Who would have the audacity to cry "Panic!" with grain in the barns and money in the banks?

If your bookkeeper don't take off a trial balance occasionally—say every thirty days—get another bookkeeper.

The conventions of the building-material trades evidence each year a greater interest in better business methods.

Don't do business with a man who don't want to see you between the date of making a contract and its expiration.

Conduct yourself each day as if the Wall Street panic had never occurred. If we all get busy, we will all do business.

Surplus is very essential to any business concern. But it should be carried in the bank, not in the accounts receivable.

It looks to a man at a cement users' convention as if there were plenty of prosperity pretty generally scattered all about.

Chicago will be the Mecca of building-material men from Boston to California on the 4th, 5th, 6th and 7th of February. Drop in.

To cut prices in an off season is the worst thing you can do. When your order book is full, don't shove so hard. When you need the business, keep on trying, but don't cut the price.

If you would be in the public eye, use ROCK PRODUCTS. Added earnings mean shorter business hours. Is this not worth striving for?

The Interstate Commerce Commission might take a whack at the obsolete method of the freight departments of the railroads in handling overcharges.

There is plenty of work for every man interested in the advancement of the great cement industry if he will just jump in and tackle the first job right in front of him.

With a safety valve on our legislators at Washington and assurance that the American people are going to put up the right kind of a man for President in the fall, why bother about this being election year?

Why should not the retail lumberman handle everything from the concrete for the foundation to the roofing material, including finish for the interior? His not doing so will encourage new building-material men in his own town.

As to the general prospects for business during 1908, ninety-four traveling men, covering the ground from the Rocky Mountains to the Atlantic Coast and from the Gulf almost to the North Pole, in a recent conference agreed that business conditions are improving daily.

Emergency circulation may be all right, but for heaven's sake let's have another commission appointed to study this proposition for a few years and then form a "steering committee" in the lower house of Congress. We may thus eventually get a satisfactory circulating medium.

The Rock Products Annual.

In this January issue we greet our growing family of readers and advertisers with tidings of hope and cheer for another year of progress and prosperity. To appropriately mark the beginning of 1908 and our confidence in the future, especially of the great and growing cement industry, we have made this a special number. It is the ROCK PRODUCTS ANNUAL for 1908—the first of what we hope will be a mighty series marking the triumphant reign of King Concrete. Its overshadowing feature is, of course, the fourth annual convention and exposition of the National Association of Cement Users at Buffalo. As will be seen from the full account printed elsewhere, it was an event of momentous importance and successful as it was significant.

A Sane View of Business Prospects.

A comparison of the real estate transfers, building permits, etc., of 1907 with those of 1906 shows an apparent decrease, which we all understand, as the matter has been explained editorially in these columns. The prospects for 1908 are better than they seem on the surface, however. The speculative element in building has been eliminated. There is a noticeable reduction in the price of various materials. Money has loosened up materially, and no doubt will be plentiful, especially for legitimate building operations. All this means a good volume of business and without the disadvantage of abnormal prices for material and labor, especially the latter. These conditions will encourage the man with money in his sock to invest it in building. And we should all bear in mind that volume without profit is not satisfactory. A fair amount of work at a fair price, without being overworked, every day in the year, will produce the best results.

EDITORIAL CHAT

J. C. Van Doorn, whose pleasant face is shown on this page, represents the Universal Portland Cement Company in the Northwest, with offices at Minneapolis. There is no more popular salesman in the business than Van, and that the Universal product is booming in the Northwest since he took hold goes without saying. Mr. Van Doorn is popular with the trade everywhere. He is the secretary of the Northwestern Cement Users' Association.

S. L. Avery, president of the United States Gypsum Company, stopped off a few hours in Chicago the other day, en route from New York. He was on his way to California and remarked to ROCK PRODUCTS that prospects are good for a healthy business year.

Fritz Worm of the German-American Portland Cement Company, La Salle, Ill., was in his happiest frame of mind when in town the other day. It was the annual meeting of the company, and the dividends

J. C. VAN DOORN.
Secretary of the Northwestern Cement Association, Minneapolis.

looked like a real successful year's business. He did not think that the world had to come to an end in 1908, notwithstanding the present values of cement. Mr. Worm gained his early experience in the manufacture of cement in Germany, where the principal stockholders of his company are located and are large manufacturers of cement.

The Northwestern Steel and Iron Works, formerly of Elmira, N. Y., now located at Eau Claire, Wis., have what is known as the "Northwestern Lime Concrete Machinery," including a brick machine, block machine and concrete mixer. They have been quite successful in placing these machines before the trade. In order to take care of their large business they have added a great many new molds in their porch column and balustrade outfit and have built a large plant at Eau Claire, which covers over 40,000 feet of floor space. They keep their machinery up to date, and when a buyer gets one of the Northwestern line he will be satisfied.

Everybody has heard about the proverbial department stores, where they keep everything from a needle to an elephant, but the combination of ham, soap, pickles, pool tables and cement does seem to be something really new under the sun. It's a fact, however, as ROCK PRODUCTS readers may all see from the reproduction printed herewith in small facsimile of the ad of our good friends William H. Anderson & Co., which we clip from the pages of one of our most esteemed contemporaries, the Manila Daily Bulletin.

The Perfection power block machine, which attracted no little special attention at the Buffalo convention, is the embodiment of the best principles of applying power to the manufacture of concrete blocks. Whether sand, gravel, crushed rock or furnace slag is used as an aggregate, the directly applied pressure of 200,000 pounds compresses the mass into the most compact form and thus aids the crystallization of the cement. A large number of blocks were made at the Buffalo exhibition of various kinds of aggregate, and in every instance they were models of perfection. The equipment included steam seasoning kilns to show the advantages of curing the blocks by this scientific method. The inventor, W. L. Dow, is an architect of experience, and he has provided many different faces for the blocks; also window caps and water tables, and every other convenience to make the outfit of the stone manufacturer complete. The sand-lime brick feature has not been neglected, for it is realized that this line of goods made of the sand-lime materials has never been properly provided for before. It works perfectly in this specialty also, and is worthy of investigation and trial at once. There is an opportunity for many ambitious manufacturers in the Perfection outfit.

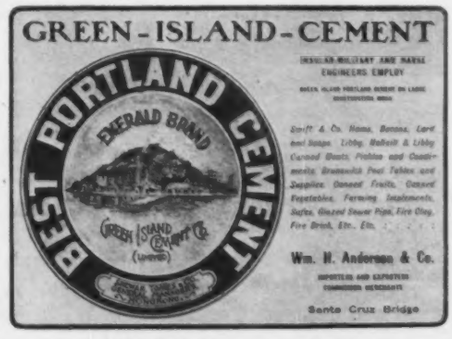
The specifications for standardizing of cement mortar blocks and concrete blocks as prepared by E. S. Larned, C. E., and slightly amended and adopted by the National Association of Cement Users, marks the establishment of that branch of the industry upon a solid, dependable basis. While there are many who consider that the specifications are in some things too rigid, yet all will admit that such standard material will pass muster anywhere, or, what is more important than that, they will never fail or cause a disappointment. At last it is universally admitted that the wetter the material is at the time of molding the block the better.

The Western lumbermen are having a great convention at Kansas City. They are getting to be the main users of builders' supplies out in that direction, and ROCK PRODUCTS will be on hand to meet them.

B. H. Rader, Pittsburg, Pa., the Eastern sales manager of the Universal Portland Cement Company, with general offices in the Frick Building, reports the big new mill near Pittsburg in full working order now, steadily grinding out the most essential of all building materials. Mr. Rader was at the Buffalo convention with his whole sales organization. Of course they are all aggressive young men, bound to carry the Universal banner to the front.

Harry F. Rauch, who sells Whitehall cement, did the transformation act last week by covering two conventions at once. He was in evidence at Buffalo, but left in time to mingle with his own customers at Columbus, where the Ohio dealers were also in convention.

A comparatively new field for investment is the cement vault business. People have discovered that steel vaults soon disappear and that sectional cement vaults are in many respects undesirable, because the freshly made joints do not have time to season and green or unseasoned joints are really no better than lime mortar. The Hoosier Cement burial vaults overcome all possible objections and the molds, being made exclusively of steel, do not admit of shrinking, swelling or warping. They have also many other points of advantage which it will pay any one interested to carefully investigate. An inquiry addressed to Ball & Brookshier, Thorntown, Ind., will bring full particulars.



ADVERTISING IN THE PHILIPPINES.

Nebraska Cement Users' Association.

The third annual convention of the Nebraska Cement Users' Association will be held at Lincoln, Neb., February 4, 5, 6 and 7. Judging from the letters received by Secretary I. E. Watenpaugh it promises to be the best that was ever held in this section. The reports at the recent executive committee meeting indicate that it will be far beyond expectations, and there is every indication of a grand success. The headquarters of the convention will be at the Lindell Hotel, corner of Thirteenth and M Streets. Through the courtesy of the Board of Managers of the State University the new Temple Building of the State University, Twelfth and R Streets, has been secured for the meeting-place. The well-lighted basement will be used as an exhibit room for displaying cement and concrete machinery. Several new and attractive features will be added to the program for this convention, and there will be on exhibition several things of educational value to cement users. The executive committee is exerting every effort to make this instructive as well as entertaining for every delegate. The committee is anxious to have each visitor bring a sample of the sand that he uses. A number of briquettes will be tested at the university for those desiring these tests. The manager of the convention is C. R. Lehreck, Sixteenth and Y Streets, Lincoln, who will make reservations for exhibit space and look after any detail connected with the exhibition.

The territory of this association embraces Nebraska, Kansas, Oklahoma, South Dakota and Eastern Colorado. The officers have worked hard to prepare a program that will make it worth while for every

OFFICE BUILDING OF THE BONNER PORTLAND CEMENT COMPANY, BONNER SPRINGS, KAN.
(Constructed Entirely of Concrete.)

cement user in the territory to attend the Lincoln meeting. The small investment of expenses and time will be repaid a thousand fold. Let every man interested in cement and concrete in this section show his appreciation and loyalty by attending and giving his support to the energetic and efficient officers of the association.

The present officers are: L. E. Porter, president, York, Neb.; R. B. Smith, first vice-president, Lexington, Neb.; W. F. Roney, second vice-president, Grand Island, Ia., and I. E. Watenpaugh, secretary and treasurer, Western, Neb.

Attractive Calendars for 1908.

The calendar of the Roessler & Hasslacher Chemical Company, 100 William Street, New York, is in excellent taste. It presents in an artistic frame with chaste ornamentation one of Wunnenberg's classic paintings.

"A Cloud on the Title" is the name of a painting by W. Verplanck Birney which decorates the artistic calendar of the Ashland Fire Brick Company, Ashland, Ky.

The Hunkins-Willis Lime and Cement Company of St. Louis are sending out this year a striking calendar. The illustrated feature is a splendid piece of embossing work, representing a team of three magnificent dapple grays attached to one of their large delivery trucks.

Hunter, Rourke & Co., the enterprising building material dealers of Urbana, Ill., have issued a handsome business calendar which displays a view of their handsome warehouse. Surmounting the cornice of their building is a lifelike representation of the feline emblem of the Hoo Hoo, and in the foreground are shown eight of their splendid horses.

The annual greetings of the Cement Tile Machinery Company, Waterloo, Ia., are in the form of a handsome calendar with a beautiful picture in colors entitled "In Springtime."

The New Line of Tile and Pipe.

To dealers in builders' supplies the leading feature of interest developed both at the Chicago Cement Show in December and at the Buffalo convention of the National Association of Cement Users has been the successful introduction of concrete structural tile for fireproofing purposes, and the many uses of the rapidly expanding concrete construction. These tiles are adaptable for partitions, for curtain walls and for many purposes yet undeveloped, such as stair treads and conduits for wires and pipes. Their toughness and light weight, together with the possibilities they offer for treatment of exterior surfaces, particularly recommend them for use in curtain walls, because they relieve to a large extent the factor of dead weight with fire-resisting qualities and strength superior to any other material of the same displacement. Besides this, the price and cost of setting is another consideration of the first magnitude. For partition walls the same advantages apply, and in addition they offer a splendid plastering surface without any further preparation. When used in the construction of concrete floor arches they make the most homogeneous span possible, for with the reinforced stringers the whole span becomes a concrete whole, having the same expansion and contraction coefficient under the stress of fire and water tests, and in this way being superior to any possible combination of concrete stringers and clay ware with widely differing ranges of expansion when subjected to high degrees of heat.

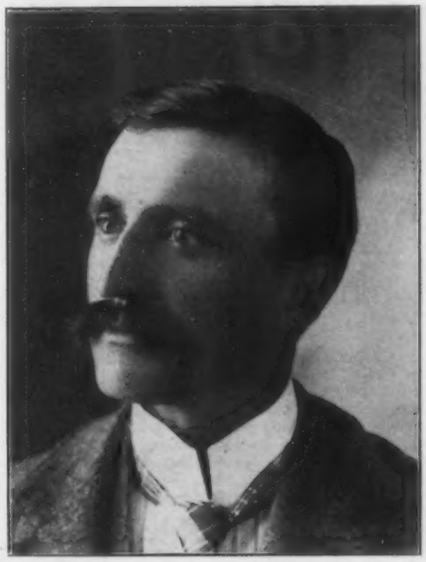
This is a proposition that attracts the commendation of the most eminent engineers of the country, and the leading architects pronounce this concrete tile the most wanted new material that could possibly be produced. Without hesitation it is being specified faster than it can be produced.

The tile itself and the machine with which it is manufactured have been invented and developed by A. A. Pauly of Youngstown, O., who is the manager of one of the largest sand-reclaiming properties in the country, and who has already won no little prominence as an inventor of cement-working machinery. The process of manufacture makes a distinct test of the materials contained in each batch of tiles made, for the wet concrete mixture is subjected to live steam, and the curing process is also conducted in conjunction with steam and moisture at a sustained temperature.

It is not a little catchpenny cement block affair or to be confounded with anything of that sort. It is a manufacturing undertaking where the demand is practically inexhaustible in every locality, and it carries a legitimate profit which is very attractive to those prepared with the capital and natural advantages to operate a good-sized plant successfully.

Dealers in supplies will readily grasp the advantage of handling tile of all sizes and shapes and sewer-pipe and conduits that can be made and delivered in a week or two without freight charges or breakage—and at the same time get all the profit.

P. F. JONES.
Who Sells the Machines to Make Concrete Tile.



A. A. PAULY, INVENTOR OF THE CONCRETE STRUCTURAL TILE.

Sand operators will find in this line of concrete tile and pipe an opportunity to transform a part of their product into a commodity that will net a very handsome return on the investment and attention, one which has a ready market the year round. Furnace slag and crushed gravel make first-class aggregate, while granulated trap-rock or granite or crushed limestone may be used to make very high-grade goods.

Compression tests and fire tests have been conducted with the utmost care to give the material the last chance to prove itself, and in every case it has excelled all comparison.

Several leading markets are already provided with plants that will be ready to manufacture this line of goods upon a commercial basis this spring, and it is the aim of the Concrete Stone and Sand Company of Youngstown, O., who have the exclusive sale of the machines, to seek only one approved customer in each market to manufacture and introduce the goods.

Samples of a few shapes of this line of goods will be on exhibition in Chicago during the dealers' conventions in February, and every supply man and sand operator is invited to inspect and investigate for himself what is considered to be the most important development in the whole concrete field in the past year.

The inventor, A. A. Pauly, wants to meet all interested parties, and P. F. Jones, the machinery salesman, will state the requirements for establishing a complete plant, or explain the workings of the machine and quote prices for parties who want to take the matter up definitely.

A Practical Cement Cart.

BRADLEY, ILL., Jan. 8.—The Burrell Manufacturing Company, makers of the X-L-All cement cart, report a steady increase of orders. W. C. Burrell, president of the company, when interviewed at his office, said: "We have had a steady flow of inquiries from cement contractors and cement workers in general for a cart that would enable them to handle cement in the most economical form—meaning by that saving of cement as well as of time in carting it from the storing quarters to the immediate place of operation. Considerable time was spent in studying the conditions as they existed from the worker's standpoint, and from our own experiences and those gleaned from the larger contractors we have built a cart that eliminates these difficulties, at the same time adding new features of benefit to the man at the head of the job. This cart is made substantially of steel and iron, with a water-tight cover that prevents loss of cement from rain or other weather conditions. It has a capacity of three barrels. Our plant is well equipped, and we have made preparations to make the carts in large numbers. Aside from this cart we make a full line of cement workers' tools and are busy all the time supplying the demand."

Treasurer Tucker of the C. H. Little Company, Detroit, Mich., is spending a month's vacation in California.

Iowa Association of Cement Users.

That the efforts of the officers of the Iowa Association of Cement Users are being rewarded is evidenced by the great interest manifested by cement users, manufacturers and equipment firms in the coming convention in Des Moines February 19, 20 and 21. There is a lively demand for space for exhibits and some good papers and addresses on pertinent topics are promised for the program.

The sessions of the convention will be held in the large assembly hall of the Savery Hotel, which is to be the headquarters. The exhibits will be placed in the convention hall and the corridors and parlors of the hotel. Negotiations are under way for suitable ground floor space conveniently near headquarters, where machinery may be shown in operation. The management is confident of success in the matter, and prospective exhibitors may depend on a good location for machinery to be operated.

Space for exibits may be reserved by application to Ira A. Williams, secretary, Ames, Ia., or to the manager of the Savery Hotel, Des Moines, Ia. The fee for space is 10 cents per square foot occupied, with a minimum charge of $5 to one exhibitor.

For the program are already listed President R. L. Humphrey of the National Association; Dean A. Marston, Iowa State College; Thomes H. MacDonald of the Iowa Highway Commission; H. K. Dodge, construction engineer; F. L. Reeder, engineer of bridges and culverts, and a number of others who promise papers bearing on the various lines of cement work that will be profitable to all to hear.

Des Moines is without question the convention city of Iowa. Its central location makes it easy of access from all parts of the State, and, located as it is, on several main lines of railroad, is readily reached from surrounding States. Des Moines hotels are not excelled anywhere, and the city's reputation for entertaining visitors is widely recognized. There are various manufacturing plants to be visited, besides pleasure places to the satisfaction of the most fastidious.

The Sandusky Portland Cement Company (Sandusky, O.), manufacturers of Medusa water-proof compound, report that that material was used in the following work: In a cement jacket on the 850,000-gallon concrete standpipe being built at Grand Rapids, Mich.; in the tunnel work at St. Paul, done by the Twin City Rapid Transit Company; in the Art Stove Company and Bell Telephone Company contracts at Detroit; in a coal storage tank constructed by the Alger Coal Company, at Alger, Wyo.; in a concrete tank for the Turner Bros. Brass Works, Sycamore, Ill.; in a section of the concrete roof for the Chicago City Railway, Chicago, and by the C., M. & St. P. Railway Company in concrete construction work.

The Atlas Cement Brick Machine Company, Detroit, has been incorporated by Ebenezer W. Riber, Stanton Clark and Andrew R. Forrester, with $10,000 capital.

L. E. PORTER, YORK, NEB.
President Nebraska Cement Users' Association.

QUARRIES

Iowa State Quarrymen's Association.

The next annual meeting of the Iowa State Quarrymen's Association will be held at the Montrose Hotel, Cedar Rapids, Ia., on Monday, February 22. The meeting will be called to order promptly at 1 p. m. The officers of the association are: J. W. Burroughs, Marshalltown, Ia., president; N. W. Dearborn, Stone City, Ia., vice-president; Frank Erickson, Cedar Rapids, Ia., secretary-treasurer. A large attendance is expected, as the benefits of the association to its membership are becoming better recognized as time goes on.

The association is founded on the belief that the success of the business as well as public economy requires that the quarry owners shall become possessed of means whereby they may have access to all matters relating to the production of stone and means of transportation and an intimate acquaintance with the business methods and practices of all producers of stone. Some important discussions will take place at the February meeting, and the interchange of opinion and experience will undoubtedly be of great benefit to all who attend.

Fight Against Quarries Abandoned.

HAVERSTRAW, N. Y., Jan. 15.—The statement is made that at a recent meeting of the trustees of the Hudson-Fulton Commission, George W. Perkins, president of the Palisades Commission, when asked what progress the commission was making, and whether it was to compel the cession of the trap rock industry, is said to have stated that while the legislature of 1906 had extended the commission's jurisdiction so as to permit them to acquire land between Piermont and Stony Point, the Hook Mountain proposition seemed impossible to handle. The owners of the various quarries have developed valuable trap-rock property, expended large sums in the improvement of the land and in the erection of machinery, and were conducting prosperous and profitable business enterprises, and the State was not liable to pay any such price as the quarry owners demanded.

A Big Contract for Quartz.

SAN FRANCISCO, CAL., Jan. 5.—Thomas Swansborough has had a gang of men at work in the big cut in Sacramento Hill, near Placerville, Cal., building a tramway to be used in conveying quartz rock to the railroad, about a mile distant. The quartz will be shipped to San Francisco for use in the manufacture of glass. The cars on the tramway will hold about two tons of rock and will be operated one way by gravity, the horse or mule riding down on the car and on returning hauling the car back. The grade is not great, and the track, which is about two and a half feet wide, goes through a short tunnel and over a dam, where a slight ascent on a trestle will be arranged for automatic dumping of tramcars and loading, by means of a gate, the railroad car below.

It is said that this new industry calls for the sending out of 40,000 tons of rock and that it will take a small force of men probably five years to complete the shipping, which will begin when the tramway is finished in the spring. It is upon this ground that the Alderson Bros., years ago, made big fortunes in mining, and it is said that an average of one million dollars per acre in gold was taken out there.

To Open New Quarries.

STERLING, ILL., Jan. 10.—A new feature for business has just developed here, viz.: the bringing of stone from the great limestone quarries on the river three miles below Dixon. At that point there are sheer cliffs of excellent limestone rising 50 feet from the water's edge. This stone is said to make excellent material for macadam, and the cost of the transportation will be very light. The owners of the property have been in communication with Capt. N. E. Shontz of the Sterling, Dixon and Rock Falls Packet Company and say that it is their intention to open the quarries in the spring. Captain Shontz will also look into the practicability of handling the stone of the Colona quarries, which is said to be nearly as good as the famous Bedford stone of Indiana. The Captain expects that the stone business, when worked up, will keep his boats busy all through the slack season.

Reducing Cost of Handling.

SAN FRANCISCO, Jan. 15.—The San Pablo Quarry Company, whose main office is at Oakland, have a branch office here in the Monadnock Building. F. R. Blare, the engineer of their plant, which is situated at the company's quarry at Castro Point, has solved some interesting problems in the handling of material. The crushed stone is discharged from the two 750-foot conveyors at the rate of 300 cubic yards per hour to the hoppered barge. Each of the two conveyors is 20 inches wide. Underneath the hoppers on the barge is located a belt conveyor, 88-foot centers, discharging to a bucket elevator, which, in turn, discharges the stone from the barges to the storage bins, from which cars and teams are loaded. The entire equipment for the works was furnished by the Stephens-Adamson Manufacturing Company of Aurora, Ill.

Crushing Plants Work All Winter.

INDIANAPOLIS, IND., Jan. 10.—The demand for crushed stone, preparatory to spring construction work, necessitates the operation throughout the winter of some of the largest crushing-plants in this vicinity. A representative of ROCK PRODUCTS called at the office of A. B. Meyer & Co. to learn the conditions at their plants. A. B. Meyer was pronounced in his views and said:

"Our Greencastle and Portland crushing-plants will remain open all winter. We have orders on hand at the present time to carry us at least half way through the year. We are well equipped for large contract work, especially railroad ballasting, and we make this a feature of our business. At the present time we are taking from the Greencastle plant over 30,000 yards to ballast the traction lines from Greencastle to Brazil, a distance of about seventeen miles. At the Greencastle quarry we are entering the third ledge. The stone taken from this is of a granite nature, glistening and hard, and contains the properties that make the best stone for this kind of work, having been tested by W. S. Blatchley, State Geologist, and pronounced the best of its kind that he had seen. The city of Indianapolis has used crushed stone for the base of all its paving the past season, and it has proved very satisfactory throughout."

To Introduce a German Patent.

CEDAR RAPIDS, IA., Jan. 11.—The Universal Crusher Company, with a capital stock of $100,000, nearly all of which is said to have been subscribed, has been organized here through the efforts of E. A. Velde, who controls the American rights in a stone-crushing machine patented by his brother in Germany. This machine, it is said, has only fourteen parts, big and little, whereas there are more than that many plates alone in the ordinary American crushing-machine. It is also claimed for the Velde crusher that it can crush stone to any size desired and that the adjustment of the machine can be made almost instantaneously.

The officers of the new company are as follows: A. H. Newman, president; Henry Rickel, vice-president; I. L. Mitchell, secretary-treasurer; E. A. Velde, manager.

Mr. Velde says that the company will at once begin manufacture of crushers and that the work will be done in local foundries.

New Firm Takes Hold.

TRENTON, N. J., Jan. 17.—The Berger Trap Rock Company has been organized and incorporated by M. F. Berger, G. L. Berger and F. M. Gress. The company has taken over the properties and holdings of F. Berger at Byram, N. J. The quarry will be operated on a larger scale.

"Rock Excavation—Methods and Cost" is the title of a 376-page volume, with fifty-six figures and illustrations, in which Halbert P. Gillette has crowded a mine of valuable information for quarrymen. One superintendent who has purchased this book writes that he has cut the cost of his drilling and blasting practically in two since he received it and applied the methods given by Mr. Gillette. "Rock Excavation" has chapters describing: Rocks and Their Properties—Methods and Cost of Hand Drilling—Machine Drills and Their Use—Steam and Compressed Air Plants—The Cost of Machine Drilling—Cost of Diamond Drilling—Explosives—Charging and Firing—Methods of Blasting—Cost of Loading and Transporting Rock—Quarrying Stone—Open Cut Excavation—Methods and Cost on the Chicago Drainage Canal—Cost of Trenches and Subways—Subaqueous Excavation—Cost of Railway Tunnels—Cost of Drifting, Shaft Sinking and Stoping. The price of the book is $3 and it may be ordered through ROCK PRODUCTS.

New Enterprise.

BOWLING GREEN, Jan. 17.—A new enterprise will soon be under way at the White Stone Quarry. A Nashville company is putting in a big crushing plant near there and is laying a track from the Memphis Junction road to the crusher. The plant will be in operation at an early date. It will take the refuse stone of the quarry and crush it. It is said the plant, when in full operation, will give employment to from 50 to 75 men.

Change of Name.

UTICA, N. Y., Jan. 15.—The Empire State Crushed Stone Company has applied to the Supreme Court for permission to change its name to the Syenite Trap Rock Company.

New Incorporations.

At Trenton, N. J.—The Larsen-Lawrence Trap Rock Company; capital, $50,000. Incorporators: Magnus Larsen, George W. Lawrence and Lawrence E. Brower.

At Schenectady, N. Y.—The W. W. Dutton Company; capital, $10,000. Incorporators: Wildey W. Dutton, Charles N. Gardner, Anna F. Dutton, Margaret A. Gardner, Schenectady, N. Y.

At Trenton, N. J.—The Hoboken Trap Rock Company; capital, $50,000. Incorporators: Warren L. Jacobus, Monte T. Morehouse and Alfred B. Van Liew.

At New Paris, O.—The Rheinheimer Stone Company; capital, $100,000. Incorporators: David Rheinheimer, C. L. Rheinheimer, Jacob Rheinheimer, Walter Rheinheimer and Edgar L. Rheinheimer.

Pembroke, Va.—The Lantry Ballast Company, recently organized, contemplate the purchase of crushing machinery.

Granite City, Ill.—The Granite City Lime and Cement Company are in the market for crushed limestone to pass a 200 sieve.

Chalybeate Springs, Ga.—The Chalybeate Springs Development Company are in the market for crushers, mixers, brick machines and block machines.

Doylestown, Pa.—The Montgomery & Shanley Stone Quarry Company has been awarded a $150,000 contract to build a macadam road in New Jersey.

Syracuse, N. Y.—The Syracuse and South Bay Electric Railroad Company have purchased a quarry on the Whiting farm north of North Syracuse to get ballast for their line.

Rockford, Ill.—The Rockford Interurban Railway Company has installed a stone-crushing plant on its line west of this city and will begin ballasting between Rockford and Freeport in the spring.

Mexia, Tex.—The Trinity and Brazos Valley Railway, of which P. G. Burns, Ft. Worth, Tex., is chief engineer, will develop limestone quarries in Limestone County, between this point and Tehuacana, the product to be used for ballast.

Los Angeles, Cal.—Construction work will be begun by the Los Angeles Pressed Brick and Crushed Stone Company on a large plant in the Tejunga Valley, between Burbank and San Fernando, where are to be found large quantities of granite.

Muskegon, Mich.—Sealed proposals are invited and will be received by the Board of County Road Commissioners of Muskegon County, Michigan, at the County Clerk's office in Muskegon on or before February 15, for furnishing and delivering crushed limestone or field stone (hard heads).

Beatrice, Neb.—The G. H. Davis stone quarries ceased operating for the winter Thursday, January 2. With the opening of the spring weather they expect to begin again, with prospects for a larger output than any previous season. The record of shipments for the closing year was more than 1,300 cars of crushed rock.

Alton, Ill.—L. A. Doren, formerly connected with the Standard Oil Company, has organized a company to operate the Job Quarry Company property here. He says the company's plant will be operated with the best machinery and ample stock bins. Construction will be started at once and crushing operations will begin at the earliest possible date.

Dayton, O.—At the annual meeting of the Dayton Limestone Company, all the officers were reelected as follows: President, George Lewis, Cincinnati; treasurer, Walter St. John Jones; secretary, Frank Brandon, Lebanon. These officers, together with J. W. Montgomery and Howard Ivins, make up the board of directors. A prosperous year was reported and an annual dividend of 6 per cent was declared. They anticipate no decrease in business during the coming building season, and will at once add to their equipment.

Lime

The National Lime Manufacturers' Association

Meets Semi-Annually.

Peter Martin, Huntington, Ind	President
A. A. Stevens, Tyrone, Pa	First Vice-President
W. B. Carson, Riverton, Va	Second Vice-President
T. H. Fleischer, Sheboygan, Wis	Third Vice-President
C. W. S. Cobb, St. Louis, Mo	Treasurer
A. J. Whiteford, Toledo, Ohio	Secretary

Official Organ, ROCK PRODUCTS.

The annual meeting of the National Lime Manufacturers' Association will be held in Chicago, February 6 and 7. Headquarters, Auditorium Hotel. Every lime manufacturer is invited.

National Lime Manufacturers' Association.

The sixth annual convention of the National Lime Manufacturers' Association will be held at the Auditorium Hotel, Chicago, Thursday and Friday, February 6 and 7, and all lime manufacturers are urgently invited to attend. The programme is unusually interesting. Thursday afternoon will be devoted to the reports of the officers and the executive committee, the election of officers and general business, old and new, the session closing with a general discussion for the good of the association. The dinner on Thursday evening, at 7 p. m., will be a notable event. The features of the second day officially announced are:

SECOND SESSION, 10 A. M.

"Additional Developments on the Uses of Lime in Water Purification"—C. Arthur Brown, Sanitary Engineer, Chicago, Ill.

"Experiences with Combustion Utilities Company Kilns"—Theo. E. Fleischer, Sheboygan Lime Company, Sheboygan, Wis.

"The Manufacture and Plasticity of Hydrated Limes"—H. E. Bachtenkircher, of Dolese & Shepard.

THIRD SESSION, 2 P. M.

"Specification on Lime for Use in Sand-Lime Brick Manufacture"—H. O. Deurr, President Association of Manufacturers of Sand-Lime Products.

"The Improved Doherty Gasifier as Applied to the Burning of Lime"—M. Nisbet Latta, New York City.

"Gas-Fired Kilns"—A. C. Seward, Engineer, Toledo, Ohio.

"By-Products of Lime"—J. C. Goosmann, Mechanical Engineer, Chicago, Ill.

A Leading California Concern.

SAN FRANCISCO, Jan. 9.—Among the leading manufacturers of lime on the West Coast are the Monterey Lime Company, whose warehouse is at the head of the wharf at the foot of Lombard Street. At their office, 510 Battery Street, it was learned from Manager F. D. Shields that the company have recently built an aerial tramway at an expense of $50,000 from their kilns at Monterey to their loading pier. The capacity of the plant is one thousand barrels per day of ten hours' run, and oil is used for burning the lime rock. The kilns of the company are the usual style of stone kilns. The company has been engaged in the manufacture of lime for the past five years. Referring to the use of oil, Mr. Shields said it was preferable to wood because greater uniformity of heat could be secured. Steam is used for spraying. The company makes its own barrels and allows a rebate of 15 cents for returns.

A Fine Plant and a Strong Product.

EAST LAS VEGAS, N. M., Jan. 15.—The Canyon Lime Company have here a large deposit of high calcium rock and are now shipping about 300 tons per day to the beet-sugar refineries in Colorado. The lime made from this rock is very pure and makes a strong product, well adapted for chemical as well as mechanical purposes. J. H. Stearns and Mr. Pierce, formerly of Kentucky, but now residents of Las Vegas, compose the company. The photograph herewith illustrates their improved limekiln with forced draught which was erected by S. W. Shoop & Co. of Altoona, Pa., designers and builders of the Shoop kiln. This firm is composed of S. W. Shoop, mechanical engineer, and C. Z. Pote, assayer, and their laboratories for testing and analytical work are located at Llyswen, Pa.

Confident of Better Tim es.

The Farnam Cheshire Lime Company, New York City, write ROCK PRODUCTS under date of January 17:

"Business here in New York has been very poor through this panic shutting off almost every available source of revenue that we have had, and it has been a struggle to make collections of any kind. Still we hope for better things, and with the efforts of ROCK PRODUCTS trust that business will move along to our satisfaction."

Busy Northwestern Plant.

BELLINGHAM, WASH., Jan. 3.—One of the busiest places in the Northwest at this time is the plant of the Roche Harbor Lime Company, owned and operated by John McMillan at Roche Harbor. Last night Mr. McMillan arrived in the city on the Rosalie and departed for a business trip to Seattle. The tug Calcite, belonging to the lime company, arrived in port at the same time and has been tied up at Sehome dock all day.

PLANT OF THE CANYON LIME COMPANY, LAS VEGAS, N. M.

About forty white men are employed at the lime works now in addition to a number of Japanese. The lime is being shippel by vessel to San Francisco and to Sound ports. There is said to be a strong demand for lime.

Increasing Their Capacity.

HOWARD, KAN., Jan. 4.—The Moline Lime, Stone & Cement Company's plant is located two miles east of Moline on the north bank of Wild Cat Creek and on the main line of the Southern Kansas division of the Santa Fe. They have in operation three kilns with a capacity of two carloads every twenty-four hours. Natural gas is used for fuel. The lime rock found here is very hard, and trouble was experienced at first because all the stone did not burn evenly. This was overcome, however, by turning sprays of steam into the kilns. An important part of this company's business is crushed stone, and the big crusher turns out twenty cars per day. Another of even larger capacity is being installed, and a smaller one will also be put in soon.

The officers of the company are: H. Ackerman, president; J. W. Thew, vice-president; L. B. Uncapher, secretary; W. B. Everett, treasurer; Sam Lippincott, assistant treasurer, and W. A. Elstun, general superintendent. These gentlemen, with Dr. J. W. Farrow, H. P. Ellsworth and Thomas Spragg, are the directors of the company.

Blows In Another Furnace.

GADSDEN, ALA., Jan. 2.—The Lagarde Lime and Stone Company last week blew in one of the two lime furnaces which have been idle for some time, making seven out of a battery of eight now in commission. The operation of this additional furnace increases the output by 400 barrels and brings the total up to 2,800 a day. The plan is running full tilt on orders which will carry it far into the last half of next year. Friday three cars were shipped to Porto Rico. The plant is seven miles east of Gadsden.

Further Observations on High Calcium Hydrate.

BY H. E. BACHTENKIRCHER.

In a previous article the writer discussed the occurrence of calcium hydrate or lime hydrate in two forms, viz., crystalline and amorphous. Perhaps a little fuller description of the crystalline form may be of interest.

Glinka in his researches on Portland cement first discovered the development of crystalline calcium hydrate, and from this beginning several German investigators have made extensive researches. Gustave Rose thus describes the crystals of calcium hydrate:

"The crystals of calcium hydrate are always very small and can only be studied under a high power microscope. In general they are minute six-sided prisms, but they present so many smooth and glistening faces that it is hard to detect the six sides of any one crystal. The crystals are isometric with those of brucite (magnesium hydrate) and have a specific gravity of approximately 2.236, while amorphous calcium hydrate has a specific gravity of 2.078."

In the writer's observations of calcium hydrate crystals a peculiar condition was observed, viz.: that only very rarely was a complete or perfect crystal observed. The crystalline particles seemed to have been only fragments of the whole crystal. This state of affairs was quite baffling for a time, but on further thought it was recognized that this is what should be expected, as the heat developed, together with the sudden formation of the crystals themselves, would tend to produce very imperfect crystallization and disruption of the perfect crystals if formed.

As to the rôle played by these "crystalline fragments" in the plasticity of the hydrate, the writer believes it to be purely physical and mechanical, and not chemical. The solubility of calcium hydrate in water depends upon the temperature. The lower the temperature, the more calcium hydrate dissolved, but at ordinary temperatures only about 1 part in 700 parts. The crystalline form seems to dissolve as easily as the amorphous or "fluffy," as far as straight solution goes. However, the action of this solution on the crystalline form varies widely from its action on the amorphous form. When we add water to calcium hydrate, this water at once dissolves all the calcium hydrate it can at that particular temperature. This solution of calcium hydrate in water then, in turn, forms a "putty" or "batter," as the case may be, with the rest of the hydrate.

A similar action is noticed in plastic clays, and this consideration of the plastic qualities of calcium hydrate finds a striking parallel in the plastic qualities of raw clays, the flint clays resembling the crystalline form of calcium hydrate, while the plastic clays resemble the amorphous form of calcium hydrate.

The second consideration of these "crystalline fragments" is that, being angular and preserving their identity, the friction of one particle moving over the other is materially increased. This is purely a mechanical action and is independent of the nature of the material.

If we take equal amounts of two materials, one crystalline and the other without crystalline form, and add a liquid to them, the crystalline form will require more to bring it to the same consistency, since this form possesses greater surface to be covered by the liquid. Consequently, when sufficient liquid has been added to thoroughly wet every particle, too much is present to preserve a "putty" consistency, and, when the mass is spread under a trowel, as in lime putty, it works short and separates.

In the manufacture of window-glass putty this mechanical action plays an important part, and crystalline forms of whiting are avoided, since they require a greater amount of linseed oil, thereby increasing the cost and at the same time making an inferior putty. A fuller discussion of these physical and mechanical actions will be given in the writer's paper before the National Lime Association, and in addition some observations upon the counteraction and prevention of crystallization and its physical action on the resulting putty.

Planning New Texas Lime Concern.

BROWNWOOD, TEX., Jan. 9.—Plans are forming for the establishment of a lime company for Brownwood, to compete with the biggest concerns of the kind in the State. As is well known, the hills west of Brownwood and right at the city limits are composed of lime rock that makes the very finest kind of white lime. Several small kilns have been operated near the city for many years, and the proprietors have made good money on the plants.

The owner of a small kiln three miles west of town has produced and marketed 2,200 barrels of good lime this year, receiving about $2,500 for the product. Workmen claim that the Brownwood lime is equal to the best brands sold here.

Lime Industry to Help Nevada Builders.

RENO, NEV., Jan. 2.—The plant of the Nevada Lime Company, of which H. J. Darling, C. L. Hames and H. G. Wedekind are the principal stockholders, is located three miles north of Wabuska at a place called Lime Spur. The company has up to date spent between $12,000 and $15,000 on the plant, which includes a continuously-burning kiln using crude oil as fuel, a warehouse to which a spur-track recently built leads, and bunkhouses for the crew of seven men employed. The kiln is advantageously placed so as to eliminate haulage of any kind, the limestone being taken from place and loaded on tramways when it is taken to the kiln.

The kiln has been started on a test run, but after doing some burning the fire was extinguished in order to regulate the burners. When work recommences and as soon as market conditions justify, it is the intention to erect additional kilns, as the bed of limestone is practically inexhaustible.

Lime is worth now in the neighborhood of $20 per ton in Reno and closer to $30 in the southern camps. By reason of the peculiar freight rates it will be easier for the company to ship to and compete with Sacramento than to ship to Reno, and there is likely to be some active competition when the plant is perfected.

New Distributing Company Formed.

PETOSKEY, MICH., Jan. 3.—For some time there has been heard a rumor that a new lime company had absorbed the other business of this nature in this part of the State. Now, however, the facts are out and it is becoming known that the new company is the Northern Michigan Lime Company. They have not bought the other companies here, but have contracted for a large amount of the lime product of the Michigan Lime Company, the Elk Cement and Lime Company and the Superior Lime Company. The new corporation, whose offices will be in Grand Rapids, will handle all sorts of building material and will probably very soon develop into one of the largest jobbing concerns in Michigan. The officers of the new company are: Homer Sly, Elk Rapids, president; Homer Zipp, Grand Rapids, vice-president; Morgan Curtis, Petoskey, secretary, and E. D. Conger, Grand Rapids, treasurer and general manager.

Important Changes in Personnel.

ROCKLAND, ME., Dec. 31.—At the annual meeting of the directors of the Rockland-Rockport Lime Company in Boston the last of the week, Robert Winsor of Kidder, Peabody & Co. was elected president to succeed Hon. Fred E. Richards, who resigned some weeks ago, and Orrin F. Perry of New York was elected general manager to succeed H. W. Huke, who has been officiating in that capacity for some time past.

Mr. Winsor, who is regarded as one of New England's ablest financiers, has been a director of the lime company since its organization and in close touch with the great industry which it concerns. Mr. Perry, the new general manager, learned the lime business as a member of the well known firm of Perry Bros. and for several years has been in charge of the New York end of this company's affairs. Mr. Huke's connection with Kidder, Peabody & Co. takes him into another line of work, but he retains his interest in the Rockland-Rockport Lime Company and his occasional visits here will always insure him a cordial welcome.

In this city at the present time the Rockland-Rockport Lime Company has twenty kilns afire, which is better than the average for this season of the year.

Vermont Concern Reported Prosperous.

NORTH ADAMS, MASS., Jan. 10.—The annual meeting of the Vermont Lime Company of Sherman, Vt., was held January 6. From the manager's report everything seems to be in a flourishing condition. Barrel machinery, steam drills and a trolley bucket system for carrying the lime ore from the ledge to the kilns are being put in, and a hydrating plant is being talked about.

The stockholders elected F. H. Brown secretary and treasurer and the following board of directors: W. L. Phelps, R. O. Stetson, Rollin Bassett, F. H. Brown and H. S. Brown of Greenfield, Mass.; E. W. Brown of Miller's Falls and George W. Plumb of Readsboro, Vt.

The directors elected W. L. Phelps, president; Rollin Basset, vice-president; F. H. Brown, clerk; H. S. Brown, sales agent, and George W. Plumb, manager.

Quarrying Lime Rock.

WARWICK, N. Y., Jan. 16.—Word comes from Amity to the effect that nearly fifty cars of the rich lime rock abounding around that village is being quarried and shipped to the steel furnaces in Pennsylvania daily. Sixty men have been employed on the work of laying tracks to the several quarries. Several options on farms near have been closed at from $100 to $180 per acre.

Important Cincinnati Corporation.

CINCINNATI, Jan. 14.—A number of local dealers in granite, stone and other building material of that character have organized the Contractors' Stone and Gravel Company, with $10,000 capital. The incorporators are E. G. Nave, E. F. Gray, T. F. McClure, Theo. Cornelle and C. E. Holley. The new company, incorporation papers for which were issued yesterday in Columbus, will be independent of the businesses now conducted by the incorporators, but will be located in Cincinnati. Organization will be perfected later and a location selected.

New West Virginia Corporation.

MOUNDSVILLE, W. VA., Dec. 26.—The Empire Lime and Stone Company was recently incorporated with $500,000 capital stock, to develop mineral deposits. They will erect a limekiln and establish a stone-crushing plant, and their products will be lime, crushed limestone, sand and high-grade sandstone blocks. The capacity of the plant will be 1,000 pounds of lime and about 2,500 tons of crushed stone daily. The officers of the company are J. E. Hedding, president and general manager, and E. D. Leach, secretary and treasurer.

New Incorporations.

At Litchfield, N. Y., the Canfield Lime Company has been incorporated. Capital, $100,000. The incorporators are William Canfield of New Marlborough and Joseph H. Lansing and George W. Dederick of North Canaan, N. Y.

At Grand Rapids, Mich., the Northern Michigan Lime Company has been chartered with a capital of $10,000.

Quarry Operations Resumed.

SANDUSKY, O., Jan. 1.—It was announced tonight that operations will be resumed Monday in the stone quarries at Kelley's Island by the Kelley's Island Lime and Transport Company. About 600 men are affected. The suspension was due to the recent financial stringency.

What is Hydrated Lime?

As a rule the first question we are asked is, "What is hydrated lime?"

The definition we find in the dictionary for hydrate is: "To combine with water or its elements to form a hydrate."

This is exactly what is done in the manufacture of hydrated lime—and it is done so properly and completely that the chemical reaction has taken place absolutely, leaving no surplus material to combine with the air, as occurs with quick or caustic lime, a process which is commonly called air-slaking.

Air-slaking is an undesirable chemical reaction, the resulting product being of no value in a mixture with sand for the purpose of mortar. The reason is that the acting agent in the lime, which should combine with the silica of the sand, is already bound, and as a consequence is an inert matter.

In hydrated lime, however, every atom is bound by the water and will not undergo a further chemical reaction with atmospheric air in any indefinite time. The hydrated lime, on the contrary, will fully undergo another chemical reaction when brought in contact with the silica of the sand and water and will revert into a solid, hard matter, like limestone, in the wall, like all mortar. This process is much more complete with hydrated lime than it can possibly be with caustic lime, as the hydrated lime is an impalpable powder which readily and fully coats each grain of sand when mixed with it dry and is in the best possible form to undergo the chemical combination with the silica of the sand when the proper amount of water is added.

Four decided advantages over other forms of lime are possessed by hydrated lime, viz.:

1. It will not deteriorate by air-slaking, but is just as active after three years as the day it leaves the mill.

2. It is a dry powder and can be handled with the same ease and convenience as cement.

3. It does not have to be slaked. Simply add water, and the resulting putty is ready for use.

4. Every element of impurity and uncertainty is removed, making it a staple product.

In short, hydrated lime has all the good qualities of lime, and none of the bad.

Lime Manufacture in San Francisco.

SAN FRANCISCO, Jan. 15.—The manufacture of lime used in the San Francisco market is principally concentrated with four concerns, and of these the Holmes Lime Company is a leading factor and the pioneer, so far as the production of the hydrated article is concerned. In the course of an interview with H. W. Postlethwaite, president, at the offices of the company in the Mutual Savings Bank Building, a ROCK PRODUCTS traveler learned that it is the successor to the H. T. Holmes Lime Company, organized in 1864. The present company was organized in 1902, and purchased of the former concern its property, consisting chiefly of four thousand acres of limerock and redwood timber, a barrel factory, and a lime-manufacturing plant situated at Felton in Santa Cruz County, having a capacity of only some 8,000 barrels of lime per month. The lime manufacturing plants of the new company, in addition to the one referred to, are in El Dorado County and at Colfax in Placer County. The original plant has also been enlarged and modernized. The quarries of the company are extensive and consist of two kinds of rock, one being a high grade crystal, which produces white lime, suitable for plaster finishing. The other is a close-grained rock, which produces a lime of good tensile strength for brick work. The rock is conveyed from the quarry in cars by gravity to the battery of modern steel-jacket kilns, situated at Felton, about a mile away, the empty cars being returned to the quarries by means of the Font's cable grip machines, the first installed in this country. The hydrating plant of the company is also located at Felton.

The Newcastle and Colfax plants are equipped with all modern improvements requisite for economical production. The combined output of these plants is 900 barrels per day. A feature of their business is the great demand from orchardists and farmers for hydrated lime.

In addition to its lime output, the company handles a full line of building materials, including foreign and domestic brands of Portland cement, hard wall plaster—Nephi, Krisolite, Marbleite and Higginson's; McNear's common brick, California Brick and Pottery Company's terra cotta partition tile and hollow brick, Ione Fire Brick Company's fire-brick, English fire-clay and German asbestos, roofing-slate, etc.

Calling at the office of the Pacific Lime and Plaster Company, Seventh and Townsend Streets, I met W. G. Badgley, general manager. From him I learned that the company's quarry is situated near Sonora, in Tuolumne County, about 150 miles southwest of San Francisco. They have four kilns and use oil. Mr. Badgley said the proposition of an oil-burning kiln for a long time was a difficult one to solve, but after a series of experiments and with the aid of the best engineering expert on the Coast, P. F. Schneider, a satisfactory fire box was evolved. For this reason Mr. Badgley is acknowledged to be the pioneer in the successful use of oil exclusively as fuel. Since the construction of the company's kilns, twenty others have been built on the same pattern, which is a full demonstration of the practicability of the process.

The capacity of their kilns is 10,000 barrels per month. Their brand is Diamond Acme. Their lime is quick-slaking and keeps well after burning. In examining several barrels of their lime with open heads, stored in their warehouse, I found it in good condition, notwithstanding that for a fortnight past there has been considerable rainy and damp weather.

The fact that their location is such that they can ship from their kilns by both the Southern Pacific and Santa Fe railroads enables them to furnish lime throughout the entire year, when some plants, which depend on good hauling conditions, are obliged during the rainy season to suspend operations. The company makes its own barrels and their shop has a capacity of 250 barrels per day. A feature of their business is supplying the glass works with ground limestone, which enables them to utilize their spalls.

The Ash Grove White Lime Association, whose hydrating plant is at Ash Grove, Mo., and who have lime works at Ash Grove, Everton and Galloway, Mo., have issued an interesting booklet entitled "Hydrated Lime," explaining method of manufacture, points of superiority, etc. This will prove of especial interest to dealers as well as to mechanics, architects and consumers, and is sent free of charge. The general offices of the company are at Kansas City, Mo., and a request directed there, mentioning ROCK PRODUCTS, will bring a complimentary copy of this valuable publication.

Gypsum From the Mojave Desert.

AMBOY, CAL., Jan. 2.—The deposit of gypsum here is found in the middle of the Mojave Desert, along the tracks of the Santa Fe Railroad. The plant of the Pacific Cement Plaster Company is situated near the bed of an old lake, around the edge of which the gypsum has been deposited. The product of the company is consumed in the State. John J. Abramson, the company's sales manager, informed a ROCK PRODUCTS traveler that the company has recently enlarged the capacity of the factory to 100 tons in twelve hours. They have also just installed a 500-horsepower Cross compound condensing Corliss engine, and they have a 40-horsepower locomotive to haul the raw material to the mill. Virtually a new mill has been built. Their deposit of gypsum is one of the largest in the country and comprises 2,100 acres. For fuel oil is used. Mr. Abramson said he had formerly been with the J. B. Ehrsam & Sons Manufacturing Company of Enterprise, Kan., and the mill had been furnished with machinery by this company. Among the buildings on which their "Holdtite" brand of hard wall plaster had been used he mentioned the Trustee Building, Los Angeles, and the Fairmount Hotel and Merchants' Exchange, San Francisco.

Busy Dealers on the Coast.

SAN FRANCISCO, Jan. 6.—The Independent Plaster Company of California, with offices at 317 Grant Building (C. A. Proctor, manager), handle the Independent brand of gypsum products, consisting of a white article of plaster manufactured by the American Independent Gypsum Company, Fort Dodge, Ia. The line consists of hard wall, cement plaster, plaster of paris, wood-fiber plaster, stucco, finishing casting plaster and molding plaster.

At their office, 1028 Market Street, the ROCK PRODUCTS man found W. F. Kruger, local manager for the Plymouth Plaster Company, who handles Plymouth Rock hard wall, wood-fiber finish and casting plaster. Mr. Kruger said their receipts from the factory at Fort Dodge, Ia., had been simply enormous, and in confirmation of his statement showed their loose-leaf order pile for the past year, which was about a foot in thickness.

Oklahoma Gypsum Deposits.

According to recently published statistics in *Mining Science*, Charles N. Gould, professor of geology at the State University, estimates the amount of gypsum in the three regions of Oklahoma examined as follows:

Main line of gypsum hills, second line of gypsum hills, and the Greer county region, at 125,800,000,000 tons. There are at present eight gypsum mills in operation in Western Oklahoma, whose output runs from 40 to 100 tons per day. Coal is the fuel used, the greater part coming 200 to 250 miles, the price at the mills ranging from $4 to $6.50 per ton. There are two problems to be solved in connection with the gypsum plaster industry of Oklahoma, namely, available gypsite deposits and cheaper fuel. The plaster men believe that the greater part of the gypsite has been located, and that the supply will soon be exhausted, but Professor Gould says there is geological reason for believing that there are vast undiscovered deposits of gypsite in each of half a dozen western counties, and that he is convinced after ten years of careful study that, at a conservative estimate, not 10 per cent of the available gypsite deposits have yet come to light. The fuel problem he considers more difficult. The geological structure of the gypsum region renders any expectation of discovering coal, petroleum or natural gas futile. After discussing coal haulage from the nearest supply, 200 miles, he considers the most practical solution of the fuel question is to pipe the natural gas to the gypsum, as the gas mains are already laid to Oklahoma City and will probably soon be extended to El Reno, which is not more than fifteen miles from the southern end of the gypsum hills.

The Bureau of Manufactures has been advised that not only Oklahoma but Kansas and other contiguous Western States desire to secure foreign markets for these gypsum deposits.

Closed for Extensive Repairs.

LARAMIE, WYO., Jan. 15.—The Acme Cement Plaster Company's plant here has been closed and will be rebuilt, this being the only plant belonging to the St. Louis parent concern which has not been able to keep up with its orders. Its output has amounted to several thousand tons a month.

Building Another Big Plant.

The American Cement Plaster Company of Lawrence, Kan., is building at Grand Rapids, Mich., what will be one of the largest establishments of its kind in the country. About two years ago Warren Henley spent a summer in Grand Rapids studying deposits in the locality. He found valuable mines in the vicinity and the land was purchased. Ever since that time the erection of a plant on the property has been contemplated, but only recently was the contract let. With the completion of this new plan the American Cement Plaster Company will have six mills turning out plaster. The permanent headquarters of the company are located at Lawrence. A. Henley, J. A. Henley, Ben Williams and Arthur Mackey are the men responsible for the growth of the company. The company was recently granted permission to do business in Texas, and Acme, I. T., will be headquarters for the Texas operations. The capital stock in the bill seeking this privilege was placed at $1,250,000, and A. and J. A. Henley and B. A. Williams of Lawrence and Joab and David Mulvane of Topeka were named as the incorporators.

Employing Plasterers Elect Officers.

NEW YORK, Jan. 20.—The regular annual election of officers for the International Employing Plasterers' Association was held on Wednesday, January 8, at their headquarters. Mr. Thomas J. Mannion, who has been its president since the organization, was unanimously re-elected. The other officers chosen are: Vice-president, F. C. Lamonte; treasurer, Joseph Van Note; secretary, John T. Waters; and business agent, John F. Niebuhr. The new executive committee consists of the following well-known plasterers: John McCahill, Thomas Windsor, Thomas Fanning, Pasquale Salvator, P. Grassi, Thomas F. Malin and W. Wales.

JOHN F. NIEBUHR,
Business Agent I. E. Plasterers' Association.

The efforts recently put forth to make the association national in its scope through the organization of local associations throughout the country have been followed by gratifying results, and the number of inquiries received from all parts of the United States since this purpose was set forth in ROCK PRODUCTS shows that it fills a real need among employing plasterers. The results accomplished by the New York body furnish the best proof of what can be done in their cities by a united effort on the part of employing plasterers. Over $20,000 worth of foreclosure work has been settled through the organization here and more than $6,000 in claims collected for its members.

A Well Known New York Plasterer.

On this page is printed a picture of John F. Niebuhr, business agent of the International Employing Plasterers' Association, whose headquarters are at 74 West 126th Street, New York. Much of the success of this organization is due to the untiring efforts of Mr. Niebuhr, whose business it is to negotiate settlements between the employing plasterers and builders with whom they might have misunderstandings. To say that he has been successful is putting it very mildly, for the International Employing Plasterers' Association has become a great power in the city of New York.

Mr. Niebuhr is a native of New York and was educated in its public schools. He entered the law office of Samuel W. Weiss, 45-47 Wall Street, with the intention of learning and following that profession, but, not being satisfied with the indoor life, he soon changed his determination and began work for one of the largest employing plasterers in New York, Michael McCormack, where he learned the plastering trade. Eight years ago he began business as a contracting plasterer on his own account and has since that time completed some large contracts.

Mr. Niebuhr is a director in the Builders' League of New York and was re-elected to the office of business agent of the International Employing Plasterers' Association at their meeting on January 8. He is a charter member of this organization and since its inception has been one of the hardest and most earnest workers in its ranks. Mr. Niebuhr is also a member of the Knights of Columbus, and holds an honorable discharge from the famous Twenty-second Regiment, New York State Guard.

Nova Scotia Plaster Deposits.

ANTIGONISH, N. S., Jan. 5.—Hon. D. A. Richard of Dorchester, N. B., was here last week in the interest of the Albert (N. B.) and Newark (N. J.) Plaster Company, who have a plant at Albert to refine plaster for the Canadian market and one at Newark for the United States. This company has been acquiring plaster deposits in Eastern Nova Scotia. At McKinnon's Harbor, C. B., they have purchased large areas, whence some four thousand tons of plaster will be shipped to New York next summer. This winter a wharf will be constructed and during the coming summer a railway will be built from the deposits to the wharf, a distance of about one mile. As there is twenty feet of water ninety feet from the shore, it will only be necessary to extend the wharf out one hundred feet. Mr. Richard has several times visited Antigonish to inspect the large plaster deposits and to inquire into conditions with respect to the probabilities of profitably marketing the article. He finds two difficulties, however, absence of water shipping facilities and the unreasonably high figures asked by owners of these deposits.

Time Extended to Finish Plant.

RENO, NEV., Jan. 5.—The Commercial League has extended the time of the Marbelite Plaster Company for completing its plant in Reno from December 31 to April 1. This was made necessary because the company has been delayed in receiving material for the completion of its plant. H. Gould, the superintendent, hopes to have the works in full operation before the expiration of the time limit. With a partially completed plant, work was started last month, and in two weeks the payroll amounted to $4,037.60.

It is estimated that when the plant is in full operation not less than 150 men will be employed.

Something About Contagion

BE GOOD AND YOU WILL BE WISE!

Why should plaster manufacturers, with the best and most modern mills, fine gypsum deposits, and well organized business, cut the price down to less than cost? Occasionally this is done.

No doubt the aggressor will say he had good reason to cut the price, because somebody else did. Perhaps Aggressor No. 2 says he'd be darned if he was going to let his local trade go to somebody else because that somebody cut the price, or on account of a low quotation—he could cut prices, too. Then No. 3 comes along with his little hatchet and chops down another tree, and it's "troublesome times."

Why does smallpox spread? Because the disease is an infectious one. Aggressor No. 2 is mad all through; No. 1 is laughing up his sleeve, and No. 9, No. 10 and No. 13 are damning everybody. Who does the collecting in a case of this kind? Nobody but the consumer.

If the dealer sold below cost all the time, he would get the smallpox too, and give it to the consumer, but the trouble is this: Nobody in the trade really reaps any benefit in the free-for-all scrap. There is a great deal of danger in a case of "price-cutting smallpox," for it spreads quicker than a prairie fire in dry grass, and with a reduced volume of business it might spread as did the "cement smallpox."

Better get a little virus and start vaccinating a few plaster men in certain sections, beginning with the chief aggressor.

A Notable Conference.

The supplement of this issue of ROCK PRODUCTS puts the readers face to face with the sales force and heads of departments of the United States Gypsum Company, who were recently in conference for three days at the Auditorium Hotel, Chicago. This,

their second annual convention, was held January 8, 9 and 10 and was presided over by S. L. Avery, the head of this great industrial organization. There were ninety-four in attendance. Each day a conference was held on matters of particular moment to the prosperity of the United States Gypsum Company.

On the evening of the 8th a smoker was held at the Auditorium, and the several divisions of the sales department furnished sketches and entertainment. The second evening the delegates were entertained at the performance of "The Man from Home," at the Chicago Opera house. The last feature of the session, a banquet, was held at De Jonghe's. It was a busy time, for they sat at the table from 7:30 p. m. to 1:30 a. m.

During one of the afternoon sessions the operating department contributed information of special value as to how the various products of this company were made. Demonstrations were given as to the "Excuse, Use and Abuse of Finish," and especially the use of "Universal Finish," as the synonym of all that is best. A special demonstration of Sackett plaster board and its uses was also given the visiting salesmen, making them more enthusiastic than ever. The only visitor was F. L. Kane, general manager of the Sackett Plaster Board Company, which is represented in a number of States by the United States Gypsum Company.

It was a successful meeting, and all went home gratified with the knowledge and enthusiasm gained in the exchange of ideas and information, which will insure greater sales of the various products of the United States Gypsum Company in 1908.

Plaster Company Branches Out.

JOHNSTOWN, PA., Jan. 7.—The Johnstown Wall Plaster Company has secured permission from Hirrisburg to change its name to the Johnstown Builders' Supply Company and to increase its capital stock from $25,000 to $50,000. The enlargement follows the purchase of the builders' supply business of R. D. Jones. The consolidated business will be conducted from the company's extensive plant in the Seventh Ward, catering to both the local and shipping trade.

The officers of the new company are as follows: President, R. D. Jones; vice-president, Robert Moffett; secretary, Roy Jones; treasurer, D. C. Heinze. Directors: R. D. Jones, D. C. Heinze, William Knable, Robert Moffett, and Harry Barnes. McClure Rowland will continue as manager of the plaster plant, while R. D. Jones will have general charge of the other lines.

Albany, N. Y.—The Paragon Plaster Company will erect a new factory building.

Huntsville, Ala.—The Huntsville Wood Fiber Plaster Factory, which began operations here on January 4, is a local enterprise representing an investment of about $8,000.

Roswell, Tex.—A second Acme plastering manufacturing plant has been built on the Pecos River about twelve miles northeast of Roswell on the P. V. & N. E. Railroad, at a total cost of $150,000.

Mason City, Ia.—Richard R. Gentry, one of the engineers who built the Northwestern States cement plant, is reported to have purchased a large block of stock in the gypsum industry at Ft. Dodge and will remove to that city to give the business his personal attention.

Utica, N. Y.—At the annual meeting of the American Hard Wall Plaster Company the following directors were elected: Thomas R. Proctor, Joseph R. Swan, Frederick G. Weaver, J. L. Hughes. The following officers were chosen: President, Thomas R. Proctor; vice-president, Joseph R. Swan; treasurer, Frederick G. Weaver; secretary and general manager, J. L. Hughes; assistant treasurer, Ernst E. Adams.

Oakfield, N. Y.—The process referred to in the December issue of ROCK PRODUCTS in the article describing the splendid new plant of the Niagara Gypsum Company, Oakfield, N. Y., is the Cummer continuous gypsum calcining process, and it was installed by the F. W. Cummer & Son Company, Cleveland, O., manufacturers of the famous Cummer dryers.

The Lycoming Calcining Company of Garbutt, N. Y., originally installed a Cummer continuous gypsum calcining process, and when they doubled up their capacity recently they installed a second. The Charlotte Plaster Company of Charlotte, N. C., investigated the plant of the Lycoming Calcining Company and on the strength of results being obtained there, are now also installing the Cummer process. The F. D. Cummer & Son Company (Cleveland, O.) report general indorsement of the claims made for their process in point of quality of production and saving in cost. They also report a growing demand for the famous Cummer dryers.

Character and Uses of Gypsum.

BY ERNEST F. BURCHARD.

(Extract from Mineral Resources of the U. S. for 1906.)

Pure gypsum is a hydrous lime sulphate having a chemical formula $CaSO_4.2H_2O$.

As excavated for a plaster plant, gypsum will usually carry varying and often high percentages of such impurities as clay, limestone, magnesian limestone, iron oxide, and silica. Where the material occurs in an earthy, granular condition, it is known as gypsite, and this form of the mineral may carry 10 to 20 per cent of impurities.

Range and Distribution of Gypsum.

Gypsum occurs in sedimentary rocks of practically all ages, either in the crystalline form or as rock gypsum, and it is widely distributed over the world. It is found commonly in the vicinity of beds of rock salt. In the United States workable deposits are confined to beds of rock gypsum, which occur at comparatively few geological horizons. The gypsum beds east of Missouri river are, for the most part, in Paleozoic rocks, while those of the West are mostly of Mesozoic and Tertiary age. The white gypsum sands of Arizona and New Mexico are of fine-grained material that has been eroded from rock outcrops and worked by the winds into its present condition and position in Quaternary time.

Gypsum is produced in seventeen States and Territories, besides Alaska; and in connection with the mining of the material, mills for grinding and burning it are operated at nearly all the places of production.

Uses of Gypsum.

The bulk of the gypsum produced in the United States as well as in foreign countries is manufactured into the various plasters, such as plaster of Paris, stucco, cement plaster, flooring plaster, hard-finish plaster, etc. A steadily increasing quantity is being used as a retarder in Portland cement. Refined grades of plaster are used in dental work, also as cement for plate glass during grinding, and as an ingredient in various patent cements. Considerable quantities are ground without burning and are then used as land plaster, or low grade fertilizer, while smaller quantities are used in the manufacture of paint and paper, imitation meerschaum and ivory, and as an adulterant. The pure white massive form, known as alabaster, is much used by sculptors for interior ornamentation. An interesting use to which gypsum is put, especially in England, is the Burtonization of beer. The reputed excellence of certain British beers, notably those of Burton and Newark, is attributed to the presence of calcium sulphate in the natural water used in their preparation.

Chemistry and the Practice of Gypsum Burning.

If pure gypsum is heated to a temperature of more than 212° F. and less than 400° F., all the moisture and a certain definite portion of the combined water will be driven off, and the gypsum thus partially dehydrated will be plaster of Paris. Plaster of Paris has the formula $CaSO_4.1/2H_2O$.

Three-fourths of the original combined water have therefore been driven off in the course of the process. Dehydration to this extent can, as above noted, be accomplished at any temperature between 212° F. and 400° F.; it is found, however, most economical of fuel and time to carry on the process at the highest allowable temperature.

A general plan of calcining plaster—the size and weight of machinery depending upon the capacity desired—is as follows:

The gypsum rock is crushed first in a jaw crusher; second, in a pot crusher; and then it goes to a rotary kiln drier. This drier is erected in brickwork like a boiler, and is equipped with an automatic feeder. If soft coal or wood is used as fuel, care must be taken that the products of combustion do not come in contact with the materials being dried, on account of the danger of discoloration. Fuel of any kind—oil, gas, coke, wood, or coal—is suitable. This drying process eliminates 10 per cent of moisture. Next, the crushed rock is sieved in a trommel, generally to 24 mesh. The material that does not pass the sieve is ground in buhr mills, and this product, with the screenings from the trommel, is ready for boiling. The boiling is done in a large kettle with wrought-steel sides and cast-iron or very heavy steel convex bottom. Flues pass through the kettle near the bottom and distribute the heat, which is applied below the kettle and passes around the lower part of the sides, through the flues, and then around the upper part of the sides and out at the stack. Inside the kettle is a shaft, which propels stirrers below the flues and mixing paddles above. The kettles are heavy and rest on brickwork. The ground gypsum is fed from bins into the kettle, and is constantly stirred and boiled until the remainder of the free moisture is expelled. The temperature of this preliminary boiling should not exceed 265° F., for at a higher temperature the water of crystallization, or combined water, begins to separate, and then the separation must be completed or the calcination will be a failure. To remove the necessary three-fourths of the combined water the material is then heated steadily to a temperature of 390° to 395° F. Care must be taken not to allow the temperature of this second boiling to exceed 400°, or all the combined water will be expelled and the plaster will lose its setting properties. When properly boiled the gypsum settles and may then be discharged through a gate on the side near the bottom of the kettle. After boiling, the plaster should be screened again through 40-mesh wire cloth, and the oversize should be reduced in a finishing buhr mill.

Condition of the Trade.

An active demand for gypsum products has continued throughout the year 1906. Additional deposits of gypsite are reported to have been recently discovered in Riverside county, California, and many newly developed deposits are reported from the country at large. Alaska becomes a producer through the beginning of operations by the Pacific Coast Gypsum Company late in 1906. The completion of a railroad one mile long enables the gypsum to be loaded on barges and shipped to the mill at Tacoma, Wash. In California one new mill has been started and another finished successfully its first year of business. Others report a doubling of trade. Three new mills have been built in the Fort Dodge district, Iowa, and will be producers during 1907, while the old companies report increased trade. Reports from Kansas indicate that the demand for 1906 was slightly better than in previous years, as was the condition in Michigan, where one new plant finished its first year of business successfully. In Nevada trade appears to have largely increased. In New Mexico a new plant at Acme began producing burned plaster in October, 1906, and the plant at Ancho reports improvement in business. One new plant not in operation in 1906 was built at Fayetteville, N. Y.; one plant at Mumford was run for the first time in 1906, and at Akron a new shaft 87 feet deep was sunk to a 6-foot bed of gypsum. Established concerns generally report improved conditions, some being unable to fill all orders. In Oklahoma the Romanose Company has just opened a plant; at Wautonga a plant has been operated one year; at Alva a new plant was opened in July; and several other plants report very satisfactory business. The trade in South Dakota, as well as in Texas, averaged better than in former years. In Virginia the properties of the Southern Gypsum Company at Broadford are being developed and production will begin during 1907. Increasing trade is noted at other plants. The market for Wyoming gypsum shows improvement, and a new plant has just been started at Sheridan.

At Mabon, Nova Scotia, a new mine has been opened, the output of which will be shipped by water to New York points.

Production and Disposition.

The gypsum mined in the United States in 1906 amounted to 1,540,585 short tons, valued at $1,147,129. This production represents an increase in quantity of more than 47 per cent, and in value of nearly 40 per cent, as compared with that of 1905. This largely increased production, which surpasses by far that of any previous year, is accounted for partly by the rapid increase in new producers, the total number of whom at the close of 1906 amounted to 74, as against 46 in 1905, a gain of 61 per cent. Since few of these, however, operated the whole year, they cannot be credited with a proportionate share of the increase in production. As to relative rank among the States producing gypsum, Michigan still holds first place; New York regains second place, with Iowa a close third. The remaining States show few changes in relative position since 1905, their present rank being as follows: (4) Texas; (5) Ohio; (6) Oklahoma; (7) Kansas; (8) California; (9) Wyoming; (10) Virginia; (11) Nevada; (12) Oregon; (13) Utah; (14) New Mexico; (15) Colorado; (16) South Dakota; (17) Alaska; (18) Montana.

The following tables show the quantity of crude gypsum mined in the United States:

CRUDE GYPSUM MINED IN UNITED STATES IN 1906, BY STATES.

State.	Number of producers reporting.	Quantity (short tons).	Value.	Average price per ton.
California, Nevada and Oregon	11	69,571	$ 102,064	$1.47
Iowa	8	286,857	199,222	.69
Kansas	5	165,091	59,086	.56
Michigan	7	341,716	195,892	.57
Montana, N. M., S. D., Utah, Alaska and Colorado	8	30,830	27,417	.89
New York	17	288,631	350,593	1.21
Ohio and Virginia	5	132,805	115,211	.87
Oklahoma and Tex.	9	247,937	88,808	.36
Wyoming	4	37,147	8,836	.24
Total	74	1,540,585	$1,147,129	$ .74

CEMENT

Licensed Cement Manufacturers Unite.

The Association of Licensed Cement Manufacturers was organized in New York on January 9 by the North American Portland Cement Company, the Atlas, Alpha, American, Lehigh, Lawrence and Vulcanite Portland cement companies, and various other important companies in the East and West, including the Dexter, Edison, Nazareth, Pennsylvania, Penn-Allen and Catskill, all of which have secured licenses under the Hurry and Seaman, Edison, Carpenter and other patents controlled by the North American Company. Other applications for membership have been presented and are under consideration. The officers of the association are A. F. Gerstell, vice-president and general manager of the Alpha Portland Cement Company, president; Conrad Miller, president of the Dexter Portland Cement Company, vice-president, and Alfonso De Navarro, vice-president of the Atlas Portland Cement Company, secretary and general manager.

The purposes of the association include the general betterment of the mechanical and chemical processes used in making cement, the improvement of the quality of cement, dealing with matters of traffic and shipment and the establishment of an association laboratory for technical tests and experiments. It is understood that all existing and properly equipped cement plants will be granted licenses and admitted to membership. Infringers of the patents above referred to will be rigorously prosecuted.

Nearly 70 per cent of the output of the Portland cement industry in this country is already represented by the association.

The Association of Licensed Cement Manufacturers, with its facilities for tests and experiments, its investigation of mechanical and chemical problems, its establishment of standards of quality, and its assistance in obtaining proper shipping facilities and rates, is intended to be of great benefit to its members.

The Cement Industry in Mexico.

MEXICO CITY, MEX., Jan. 20.—The use of crude petroleum for fuel is rapidly becoming general by the manufacturing establishments of certain parts of Mexico which are situated conveniently to the producing fields. The high price of coal and coke has been a great hindrance to the industrial development of the country and has served to enable foreign concerns to compete with domestic manufactories in many kinds of goods and products.

Fuel oil is to be applied to the manufacture of Obras y Bienes Raices, at its great cement plant at Dublin, State of Hidalgo. The oil supply will be obtained from the Ebano oil field, situated near Tampico. It is estimated that about 120 barrels of oil per day will be required for fuel by the plant. The price paid for the oil is about $1 Mexican money, equivalent to 50 cents in gold.

The substitution of oil for other fuel at this cement plant necessitated the purchase of about $150,000 worth of new machinery and the changing of the entire system of the factory. The chamber kilns will be changed to rotary kilns.

The cement industry in Mexico is having a steady growth and it is claimed that it will not be long until the home demand will be supplied by the domestic plants. None of Mexico's cement supply comes from the United States, notwithstanding the fact that some large plants for the manufacture of the product are located close to the Mexican border. The foreign supply of the product comes principally from Germany and England.

THE "SUNFLOWER" BRAND.

The Kansas Portland Cement Company and its Conquest of the Western Field.

The development of Portland cement manufactured in America affords no parallel feature of success comparable to what we have come to know as the Kansas field. The three indispensable raw materials have never been found elsewhere so conveniently disposed by nature for the manufacture of the one standard and staple building material which has eclipsed all others in the tremendous range of its usefulness and its unlimited adaptability.

Iola limestone, lying near the surface, is easily crushed and contains but little moisture in its natural state, making it particularly adaptable as a high-class raw material. Immediately above this bedrock are to be found mountains of argillaceous shale, while deep in the bowels of the earth are fountains of natural gas with which to burn the cement composition into clinker, with practically no further expense than the mere tapping of nature's reservoirs.

The pioneering feature of the Kansas cement manufacturing field was practically over when the Kansas Portland Cement Company was organized in 1903, and the parent plant of that concern, located at a suburb known as Gas, near Iola, Kan., was erected.

The stockholders of this concern are made up in a large part of men who blazed the way in the field and acquired the knowledge at first hand of the special requirements for successful cement manufacture in the then new Western center. The officers are: George E. Nicholson, president; A. B. Cockerill, vice-president; W. S. Goodin, secretary; L. L. Northrup, treasurer; E. C. Champion, general superintendent; F. L. Woods, plant superintendent, and B. E. Allison, sales and traffic manager.

In January, 1904, this company introduced the "Sunflower" brand, so named because it is the perfection of Kansas cement and Kansas is the Sunflower State. Immediately this brand of cement won fame and popularity, and the uniform integrity of its standard has always kept it the peer of all others in the territory where it is depended upon for every structural and engineering requirement as well as for the multiplied domestic uses to which Portland cement is now adapted.

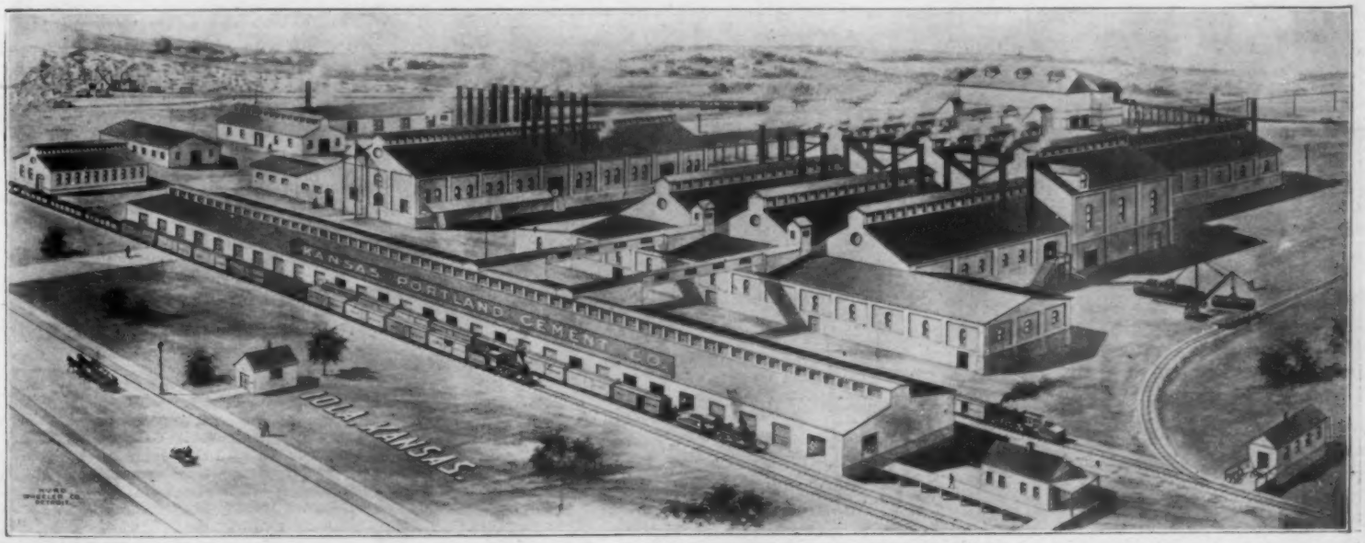
The Sunflower brand is known from the Mississippi River to the Pacific shore, and from the Canadian line to the city of New Orleans. Millions of barrels of the famous brand have been used for every possible purpose in this territory, and every one has given perfect satisfaction to the user, because it produced the exact results demanded, whether it was for building a bridge or roadway or for any special requirement in constructing a fixed asset for farm or home to increase in value as time passes on. Perhaps the greatest value obtained by the use of Portland cement is its permanence, for cement work lasts forever. The value once being created, it remains without change, the investor reaping the interest of its service continually.

In less than a year after its completion the original plant was found inadequate to meet the increasing demand for the Sunflower brand, and additional units were added to supply the capacity. At the end of the first year there were 2,500 barrels of Sunflower cement going out to the trade every day. Every part of the equipment was selected with the single purpose to assemble the most complete and perfect plant for the economical production of Portland cement, and that this aim has been obtained has been proved by the regularity and quality of the product, which thousands of users have testified to from every part of the territory.

In July, 1906, another factory at Independence, Kan., located on the only deposit of true Iola limestone in that district, came into bearing and added 4,500 barrels of Sunflower Portland cement to the daily output, the quality being identical with the product of the parent plant near Iola.

As a part of the equipment of both these plants are ample storage capacity and shipping facilities equal to any manufacturing establishment in the country. There are three loading tracks connecting with the Santa Fe, Missouri Pacific and Missouri, Kansas and Texas railroad systems, insuring prompt delivery in all directions from mill to consumer. The distribution of the Sunflower brand from the first has been conscientiously and intelligently handled, with a square deal for every customer. This has made Sunflower customers much money, and the appreciation of such methods has caused reorders and made friends for the Sunflower brand wherever it has gone. This feature, to no small extent, is to be credited to B. E. Allison, sales and traffic manager, who takes to heart the requirements of each and every customer and makes a personal effort to anticipate his needs.

The Kansas Portland Cement Company, with such equipment and such organization, extends the New Year greetings to all users of the Sunflower brand of Portland cement, with the assurance that the splendid records of the past will be maintained and even excelled in 1908.



THE PARENT PLANT OF THE "SUNFLOWER" BRAND AT IOLA, KANSAS.

ON THE GRAVITY PLAN.

The Plant and Product of the Ironton Portland Cement Company at Ironton, O.

IRONTON, O., Jan. 18.—Erected on the side of a sloping hill, a short distance to the east of this city, is the plant of the Ironton Portland Cement Company, with one exception the only cement plant in the United States constructed on the gravity plan. While the power of gravitation is not depended upon entirely, it is quite an important factor in the handling of the raw products from the time they are taken from the earth until the finished product is sacked for shipment. But one other plant, the Buckhorn Portland Cement Company of Manheim, W. Va., is built on this plan.

Besides being erected on a foundation that reaches from the base half way to the summit of what many communities would consider a mountain, the Ironton plant is peculiar in that its products all come direct from the mines to the mill under operations controlled by the same power that grinds the shale and lime and coal. They enter the upper end of the mill in their native state and come out at the bottom as finished cement.

The company has several hundred acres underlaid with a vein of the limestone for which this region is famous, and the shale is found in adjoining strata. One hundred men are employed in the lime and shale banks, where Adams and Gardner electric drills are used along with an electric undercutter. The daily output is 300 tons of limestone and 60 tons of shale, which is carried from the depths of the mines to the mills by an electric tramway running trains operated with an electric locomotive.

The limestone is dumped into a No. 5 Austin crusher, thence into a 5x40 rotary dryer, thence into Williams and Jeffrey swing-hammer mills, which crush it down to 90 per cent on a 20 mesh for tube mill feed. Thence it is passed into large storage bins, and then ground in three 5x22 Bonnot tube mills, in connection with Emerick separators, to a fineness of 97 per cent on a 100 mesh. Then it passes into storage bins in the rear of four 100-foot rotary kilns. After passing through the kilns, the clinker discharges into the rotary cooler and then into an Austin fine crusher, which crushes it down to a ¾-inch clinker and finer. From there it is elevated to a vertical cooler, the material from which is then ground in four Kent mills, in connection with four Newaygo separators, to a fineness of 98 per cent on a 20 mesh. The product is then finished on three 5x22 tube mills, in connection with Emerick separators, to a fineness of 97 per cent on a 100 mesh, and from there it passes into a warehouse containing twelve bins with a total capacity of 40,000 barrels. Here it is packed by Automatic, Richardson and Bates valve bagging machines, which also weigh it 95 pounds to the sack. It is then loaded direct into cars from the packing-room.

Power is furnished by one 750-horsepower Alfree engine, manufactured by the Ironton Engine Company, direct-connected with a 500-kw. Crocker-Wheeler generator and two 400-horsepower Russell engines, made by the Russell Engine Company of Massillon, O., belt-connected to two 250-kw. Northern generators. This furnishes electric power and lighting for the plant and mines. All machinery is electrically driven by independent motors.

The boiler-room is equipped with four batteries of Sterling water tube boilers, two of 350-horsepower and two of 450-horsepower each.

The fuel supply is brought from the mines, the company having several hundred acres underlaid with a splendid quality of coal. In the mining of the coal the same methods are employed as in getting out the limestone and shale, electrical appliances being utilized. An electric tramway leads from the mine shaft a distance of about 100 yards to a tipple which overlooks the boiler-room and from which the fuel is dumped into the bins ready for use. About eighty tons of coal are used daily, but for the mill natural gas from the mains of the United States Natural Gas Company is now being installed, a six-inch main being extended to the plant. When these connections are completed the company will market its coal.

For the use of the mill, the coal is run on tramcars to a Jeffrey swing-hammer mill, where it is pulverized and gravitates into a rotary dryer. Thence it passes into two Lehigh-Fuller mills which grind it to a fineness of 90 per cent on a 100 mesh for fuel for kiln. This is passed into storage tanks and then discharged into the kilns by forced draught.

The Ironton Portland Cement Company was organized some years ago with a capital stock of $110,000 and an original capacity of 400 barrels daily. The capital has been increased to $300,000, fully paid in, and the capacity is now 1,200 barrels daily. The officers are: S. B. Steece, president; F. C. Tomlinson, vice-president; A. C. Steece, treasurer and general manager; J. R. Paul, secretary; John A. Acker, superintendent, and Guy La Forge, chemist.

The company is highly favored with shipping facilities, having direct connections with the N. & W., C. & O., C., H. & D., D., T. & I. and Ohio River. The product has a general sale throughout this section, having passed all the Government and railroad tests. At present, almost the entire output is being used by the Norfolk and Western in extensive operations along its entire system from Roanoke to Columbus, O., especially in culvert and tunnel work. One tunnel in West Virginia, four miles long, will be constructed of the company's product.

Ironton is especially loyal to this particular home industry, and it has probably more cement block houses, industrial plants, retaining-walls and sidewalk and curb than any city of its population in the Middle West.

President Steece himself is a true apostle of cement, his own home, which is illustrated on another page, showing a fine example of porch and terrace of concrete construction.

GRAVITY SYSTEM, IRONTON PORTLAND CEMENT COMPANY.
The Ironton plant is one of the two cement plants in the country operated by gravity, the other being at Manheim, W. Va.

BONNER PORTLAND CEMENT COMPANY.

A Vigorous Newcomer in the "Lehigh Valley of the West."

An inexhaustible supply of the finest quality of accessible raw materials, fuel right on the ground in the form of natural gas, and extremely favorable situation geographically for inbound shipments of material to be used in the manufacture of Portland cement, as well as for outbound shipments of the finished product—these are the ideal conditions governing the plant of the Bonner Portland Cement Company at Bonner Springs, Kan., which it is expected will come into bearing early in February.

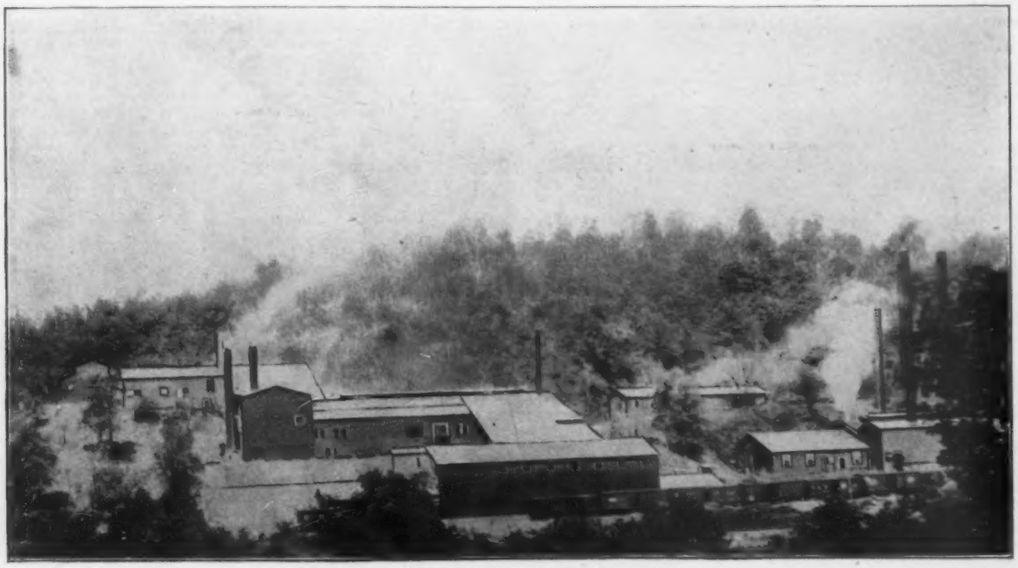
This new mill will have an initial daily capacity of 2,500 barrels, and is a valuable acquisition to the Portland cement industry of Kansas, which may properly be termed "The Lehigh Valley of the West." It is the only cement property on the entire Union Pacific Railroad with its 3,000 miles of track traversing tributary territory and embracing Denver, Portland and San Francisco. The connection with the Santa Fe system contributes additional transportation advantages, and, adjoining the Kansas River as the plant does, river transportation will afford relief in time of overburdened conditions of railroad traffic. So much for a brief reference to the raw materials and advantageous location of the plant.

The construction of the plant was under the supervision of the Freeborn Engineering and Construction Company of Kansas City, the largest organization of engineers in the United States engaged in the design and construction of successful Portland cement plants.

The most modern high-speed and maximum-capacity machinery has been installed, and every detail entering into the manufacture of a high-grade Portland cement will be under the supervision of a trained corps of skilled workmen.

With the quality of raw materials, the inexhaustible supply of natural gas for the burning of the same, the modern grinding machinery at the raw end and the pulverizing machinery for the production of the finished product, "Bonner" Portland cement will at once rank among the standards of America.

The officers and directors of this company are men of accurate business judgment, universally respected for their integrity and ability to command success. They are: W. E. Gheen, president; W. H. Caffery, vice-president; J. D. Waters, treasurer; A. L. Cooper, secretary and general counsel. The directors are: W. E. Gheen, Philadelphia; G. G. Gheen, Kansas City, Mo.; A. L. Cooper, Kansas City, Mo.; W. H. Caffery, Kansas City, Mo.; J. D. Waters, Bonner Springs, Kan.; W. B. Richards, Kansas City, Mo.; George L. Linscott, Holton, Kan.; Charles Knabb, Hiawatha, Kan.; J. W. Breidenthal, Kansas City, Kan. The general offices of the company are rooms 405-407 Long Building, Kansas City, Mo.



PLANT OF THE IRONTON PORTLAND CEMENT COMPANY, IRONTON, O.

NEWS OF THE MONTH IN BRIEF.

The Glens Falls Portland Cement Company, Glens Falls, N. Y., shut down on January 15 to make the customary winter repairs.

The Virginia Portland Cement Company, Craigsville, Va., are doubling their plant, and have recently bonded the same for $2,000,000.

The plant of the T. Millen Cement Company, Waveland, N. Y., has been thoroughly overhauled and now awaits the opening of navigation for the spring business.

The Edison Portland Cement Company have established a Southern office at Savannah, Ga., 908 and 909 National Bank Building, with George F. Balmer in charge.

The Imperial Cement Company are prospecting to locate limestone and to find to what depth it extends on the Hess and Kleppinger farms in the Nazareth, Pa., district.

Mr. A. L. Klouse, Dunbar, Pa., is treasurer of the Pittsburg Cement Corporation, capital $500,000, which, it is stated, will erect a Portland cement plant at that point.

The infant State of Oklahoma is a full-fledged member of the cement industry, having in operation the plant of the Oklahoma Portland Cement Company at Ada, Okla.

Operations will be resumed on January 27 at the plant of the Bath Portland Cement Company, Bath, Pa., which has been shut down for necessary overhauling and repairs.

One of the first mills in the Lehigh Valley to resume activities was that of the Lawrence Cement Company of Pennsylvania, who had their entire plant in operation on January 8, employing a full force.

To take care of the general increase in capacity at Bath, Pa., the Pennsylvania Cement Company have just issued bonds to the extent of $200,000 with the Trust Company of America (New York) as trustee.

The annual tour of inspection for the Atlas Portland Cement Company was made by General Manager Seamon to the Hannibal, Mo., plant on January 9. There will be no change in the present *modus operandi*.

Another plant in the Keystone State is that of the Crescent Portland Cement Company, near Wampum, Pa., which will have a daily capacity of 3,500 barrels. This plant will come into bearing early in the present season.

February 1 is the date set to resume operations at the plant of the Hecla Cement Company near Bay City, Mich. The plant has been closed for the winter in order to make the necessary repairs, as well as some minor improvements.

Weather conditions, coupled with the recent flurry, have postponed for this season the construction work on the Iowa Portland Cement Company's plant near Des Moines, Ia. The company contemplate beginning operations in the early spring.

Fredrik E. Paulson has been promoted to the office of traffic manager of the Lehigh Portland Cement Company, with headquarters at Indianapolis. B. L. Swett, H. M. Scott and C. M. Handy are the traveling representatives from this point.

J. E. Campbell, Nowata, Okla., is vice-president of the British Portland Cement Company, who are constructing a plant three miles east of that town. Two carloads of machinery have already arrived. The company's main offices are in Kansas City, Mo.

After a shutdown for some five weeks, announcement was made by the Sandusky Portland Cement Company that their plants at Baybridge, O., Syracuse, Ind. ,and Dixon, Ill., would be reopened February 15. The cement works at Castalia, O., will reopen February 10.

The American Cement Company of New Jersey declared an annual dividend of 3 per cent at the eighth annual meeting of the stockholders of the company held January 13. The net earnings of subsidiary companies for the last fiscal year, less expenses, interest and other charges, were $459,398.17.

At the meeting of the Wahsatch Portland Cement Company held in New York recently the following officers were elected: President, H. C. Baker, Ogden, Utah; vice-president, A. T. Thoits, Grand Rapids, Mich.; secretary and treasurer, F. J. Randolph, New York. Directors: A. S. Hicks, Grand Rapids; H. K. Dean, Grand Rapids; J. B. Moegridge, Newark; J. G. Gronberg, Grand Rapids; and Arthur Waldradt, New York.

January 11 marked the starting of the plant of the Northwestern Cement Company at Mason City, Ia. The company has been grinding and storing clay for some time, and with the crushing of rock now has all machinery in operation. They are now turning out commercial Portland cement and look for a busy season.

The Ash Grove Lime and Portland Cement Company (W. B. Hill, president) have bought a new gas-well with a daily production of 31,000,000 cubic feet. The Ash Grove company now have an aggregate daily production of 115,000,000 cubic feet of gas, more than is possessed by any other cement company in the United States.

The property of the Great Northern Portland Cement Company, Marlboro, Mich., will be sold at public auction March 3, 1908, by the Union Trust Company of Detroit. No bid under $85,000 will be entertained, and each bidder must previously deposit $20,000. All lands, machinery, minerals and rights-of-way will be sold in a lump.

The Whitehall Portland Cement Company have discontinued their New England sales office, and will in the future take care of all correspondence direct from the main office, Land Title Building, Philadelphia. E. G. Brick, the New England representative, will thus be enabled to devote his entire time to visiting the many customers of this company in that territory.

Latest news from the Kansas district is to the effect that the Kansas Portland Cement Company of Iola, the Independence plant and the Indian, of Neosha, have been merged with a capital of $12,750,000, with headquarters at Iola. The officers are: George E. Nicholson of Iola, president; A. B. Cockerill of Nevada, Mo., vice-president, and L. L. Northrup of Iola, treasurer.

S. B. STEECE, IRONTON, O.
President Ironton Portland Cement Company.

The Vindex Cement Company, at Evansville, near Reading, Pa., elected the following officers to serve for the ensuing year: President, John R. Miller; vice-president, J. C. Illig; secretary and treasurer, Charles T. Nagle. Directors: H. A. Weldy, John R. Miller, J. C. Illig, Charles T. Nagle, Lindsay McCandlish, Charles H. Lawrence. The mill has been closed for the winter, but will start as soon as the season opens with a capacity of 500 barrels of Vindex Portland cement a day.

Alabama will come forward this year as a Portland-cement producing State with a 3,000-barrel plant to be built at Village Springs, Jefferson County, Alabama, on the L. & N. Railway, twenty-two miles from Birmingham. The new plant is that of the Blount Mountain Portland Cement Company, whose managing officers are: H. M. Lavers, of 350 Broadway, New York, vice-president; R. E. Schneebeli, same address, secretary-treasurer, and William B. Shaffer, of Nazareth, Pa., director and general manager. The engineers in charge are the William B. Shaffer Engineering Company, J. S. Herbert, chief engineer, Nazareth, Pa. Mr. Herbert is also the architect in charge. General offices of the company are in the Nazareth National Bank Building, Nazareth, Pa.

ELECTRICTY FOR CEMENT PLANTS.

Interesting Paper Read by J. B. Porter Before the Association of American Portland Cement Manufacturers.

The following paper was read by J. B. Porter of the General Electric Company at the recent meeting of the Association of American Portland Cement Manufacturers at Atlantic City:

Mr. President and Members of the Association of American Portland Cement Manufacturers: To create an industry, to build up a trade, to take the raw material from the ground and furnish homes with the finished product is an opportunity granted to but few, and yet the successful footing that the cement industry now holds is largely due to the untiring labor of your individual members and to this organization.

The applications of cement have been so enormously increased in the last two years as to almost justify calling the present period the Cement Age. This increased demand and the high prices which have been maintained have created a large number of new companies and have stimulated the remodeling of old plants to increase their output.

It is predicted that the total output of cement for 1907 will equal, if not exceed, 60,000,000 barrels; yet this supply, it is claimed, will scarcely meet the demands.

The object of this paper is to point out some of the special advantages of the electric drive in the manufacture of cement both in economy and flexibility. From the economical standpoint the savings of one cent per barrel on a 1,000-barrel plant would justify a first cost of over $50,000. Economy in the manufacture of cement is so closely connected with flexibility that it seems almost one and the same thing. Economy to cement manufacturers means continuous operation, and continuous operation is contingent on flexibility.

There are few if any plants which are not making good profits under the present condition of prices; yet there are any number of plants who are producing cement at a high cost of manufacture because of the inefficient layout of their plants and the uneconomical transmission of their power.

Electricity Versus Mechanical Drive.

The cement industry has been very conservative in the adoption of electricity for the transmission of power; yet in every other line of manufacture mechanical transmission has been superseded by electricity even at great expense, and the results have proved that the electric drive has either increased the output, simplified the process of manufacture, improved the economy, or made easy the superintendence of the plant. Many Western cement plants are already driven throughout by electricity, and yet in the East the cement manufacturers use the electric drive only where the mechanical drive is prohibitory.

The cement industry opens a large field for the application of electricity. The simplicity in the manufacturing of cement permits of a division of the different departments in such a manner that each department can be regarded as a unit, having its local manager who is held responsible for its satisfactory operation.

With the electric installation, a ready record can be kept of the power consumed in each department, and the superintendent can easily locate the department responsible for any decrease in output for each day. A record of the power consumed in each department shows at a glance whether the consumption is above or below normal, and any deviation should require a satisfactory explanation or should indicate that the machines are not operating satisfactorily.

Electrical Flexibility.

The profits in the cement industry demand the continuous operation of each machine at its full load. To obtain this, it is necessary to have flexibility in the power applied, and electricity permits of greater flexibility than any other mode of operation.

The installation in the power house of two or three generators insures a constant source of power for each and all departments. The switchboard, if properly subdivided and arranged with one feeder panel for each department, each panel equipped with indicating ammeter or recording wattmeter, furnishes a constant indication of the power consumed by each department, and a record of these readings gives a ready reference to the operation of each department. Each department may be operated by one or more motors; if more than one motor is used, the group drive should be made as flexible as possible so that part of the load, if necessary, can be thrown from one motor to the other, or the groups entirely separate from the others so that part of the department will always be in operation.

Kilns.

The output of a plant is based on the output of each kiln and the number of kilns installed. This department is the very heart of the industry, and the successful manufacturer should provide every means known to man to keep his kilns running and crowd them to the limit of complete calcination.

To accomplish this there are three different methods of control:

Variation of the speed of the kiln.
Variation of the feed raw material.
Variation of the coal feed for combustion.

All these variations should be under the hand of the operator at the point where he can watch the calcination and change any or all of these to accomplish the most satisfactory results; here the application of the electric motor should play an important part.

Crushers.

While it is necessary to use a number of crushers arranged in groups, the most flexible arrangement would be to select a motor of about 150 to 200 horsepower and drive from a line shaft, each pulley on shaft equipped with a friction clutch. If the number of crushers require more than one motor, put in another line shaft so arranged that it can be connected to the first line shaft by means of a friction clutch. Should it be necessary to add more groups, this can be easily accomplished by placing the crushers either in parallel or series, whichever arrangement will enable the feeding and taking away of the material to be more concentrated.

Flexibility of the Buildings.

The power house, if properly designed, should permit of the shortest steam transmission from boilers to engines, and the building so constructed that should it become necessary to increase the number of units beyond the capacity of the building, the end of the building can be taken out and an extension made for both boiler and engine rooms without interfering with the continuous operation of the plant.

Electricity permits of the grouping of the buildings for each department in the most convenient sequence without being obliged to take into consideration the source of power, and also permits of the shortest transmission from one department to the next of the manufactured material. If possible, the building for each department should be constructed similar to the arrangement of the power house so that extensions may be added.

Selection of Motors.

Up to the present date it has been almost impossible to obtain satisfactory tests even on motor-driven machines in cement plants, as the power required to start some of the machines is so great and changes so quickly that it is hard to take a reading; and the running power is so small in comparison that manufacturers have been compelled to use motors of large horsepower ratings in order to be on the safe side.

There is now on the market a curve drawing meter which automatically records the power consumed, and it is to be hoped that these tests will put the consumer in a better position to specify motors which will be nearer the running horsepower of the machine than they are at present.

For best results, motors, both direct and alternating current, should be run as near their most economical point as possible, which naturally is full load rating.

It is not always possible to take these points into consideration, as the limiting feature is the starting torque, which is generally from one to three times greater than the running torque required for most cement machines, yet with these curves we believe it will not be necessary to install a 150-horsepower motor to operate a continuous load of 65 horsepower, as many of the plants are doing today.

Belt Drives.

The belt drive is generally considered the most satisfactory for transmitting power from the motors to the machines. It often happens that crushers get clogged, and it is practically impossible to furnish sufficient power to start them again without cleaning them out. The belt drive relieves the motor from the enormous shock consequent on the stoppage of the machine, and the belt would probably slip before the circuit-breaker would act, giving a double protection and also giving a protection to the cement machines that it is impossible to obtain from a mechanical drive, and you have no flexible arrangement that would automatically shut down your machine, mechanically driven, when excessively overloaded.

The belt drive also relieves the motors from the consequent jar of heavy starting loads.

At one of the local cement plants where a crusher was driven mechanically, a large shaft was twisted off by the clogging of the crusher with a sledgehammer head. It is almost improbable that such an accident could happen if this crusher had been driven by a motor with an automatic circuit-breaker.

Alternating and Direct-Current Equipment.

Until recently it has been the practice to equip manufacturing plants with direct current, 220 volts, chiefly on account of the great advancement that has been made in that line of apparatus and especially where variable speed motors are needed for certain machine tools where the requirements are such that the direct current motor is more advantageous.

The alternating current has many advantages, especially in the equipment of cement mills. The motors that are exposed to the cement dust are so simple in their construction that they do not need protection except dust guards for the bearings. The spare parts are so few as to almost be left out of consideration. The wiring and automatic protecting devices are enclosed in such a manner as to eliminate any sparking and consequent fire risk and the motors are rugged and better suited to heavy overloads.

The alternating current permits the transmission of power at a higher voltage, which will greatly reduce the cost of installation. It was estimated in one plant of several thousand horsepower capacity that the use of 600 volts instead of 480 volts showed a saving of over $8,000 on the installation alone.

For ruggedness, simplicity and continuity of operation the turbine-driven generator has no equal. This point is well illustrated by the following quotation from a letter of one of your members operating a cement mill in the West:

"The 800 kilowatt turbine now in operation is giving splendid satisfaction and there is no question in my mind but that this type of power equipment is far and away the best for cement mill practice. We have had absolutely no difficulty of any kind or description in starting or operating this machine, and from our experience so far we are inclined to think that when once properly adjusted the turbine will practically run without mechanical attention indefinitely."

This letter refers to an alternating current turbine-driven generator and was written entirely unsolicited. It was a comment on the turbine while the letter was begging the manufacturer to improve their promise of shipment on a new turbine of larger capacity.

Mechanical Versus Electrical Drive.

With the mechanical drive properly subdivided, you are dependent on one engine for one or more departments.

Electricity gives you two or three prime movers from which to draw your power.

If one line shaft distributes the power in any one department—and it generally furnishes power to more than one department—any accident to that shaft might tie up the whole production of your mill.

With electric distribution, where properly subdivided, it would practically be impossible to so cripple the plant.

A line shaft has to be installed not only of sufficient capacity for the total maximum load, but with a big margin of safety, and this entire mechanical drive has to be run continuously, whether you are operating one or all the cement machines.

With the electric installation you draw power only for the machines in operation, and the efficiency of your plant is practically maintained.

Even if your kilns were driven by a separate engine and an independent shaft, any tie-up of either of these means of power distribution would shut down and seriously cripple the day's production.

A delay of one hour on ten kilns would mean over $150 wiped out of the profits for the day, and it is seldom, if ever, the repairs can be made in one single hour with the facilities at hand.

The electric drive in this department would save you many hours of anxiety.

Mechanical transmission cannot give you the flexibility or the output you can obtain from the electric drive.

Will this Electric Drive Pay?

Your engineers ask: "How can the electric be as cheap or as economical as the mechanical drive? The dynamic power of the engine has to be converted to electric power with a generator and back again with a motor." That is perfectly true, but the commercial operation of a plant is a practical operation.

With the mechanical drive, you start your plant, get everything running smoothly, throw on your load and spend a lot of money and time to make tests on your engines to get your efficiency, and it makes a fine showing, but take the same plant after a year's run and

THE "BONNER'S" SOURCE OF SUPPLY.

Showing Stratification of Limestone and Shale on the Company's Property.

find what an enormous increase is demanded to accomplish the same result. It has been necessary to patch up here and there and to do it in the shortest possible time, for the plant must run, and instead of 20 or 30 per cent less in the mechanical transmission, you will find this figure enormously increased, and you have practically no means of knowing this except from the coal pile or another series of tests.

The electric transmission depreciates with far less rapidity than the mechanical, and any change or patchwork in the plant affects only a small percentage of the gross output of your power station.

You have always before you the instruments showing the power consumed, and any increase in the demand for power is shown immediately. This fact alone would justify the electric drive where it is so important to operate continuously and to anticipate and to avert any trouble.

Co-operation.

It is practically impossible for an electrical engineer to make satisfactory recommendations of electrical apparatus in a cement plant or any other kind of manufacturing plant without being perfectly familiar with the conditions under which the electric motor is to operate. This requires the hearty co-operation of the superintendent of the plant with the electrical engineer.

Competition.

The keen competition of the present period demands the highest quality, together with the greatest output of material with the least possible cost.

To be in a position to stand this competition it is necessary for all manufacturers to use every means possible to bring their plants up to the highest points of economy and efficiency. It requires a man of strong character to seize the proper opportunity (which is generally dull times) to make these changes in his plant in anticipation of the increased demand which will result from an inactive period.

A card index should be made of all generators and motors installed, and a record of any repairs or tests should be kept on these cards, the dates always being specified.

The meters on the switchboard should be read at stated intervals during the day and night, and a regular record made and filed away for reference. These records will appeal to engineers, superintendents, managers and boards of directors; and such a file of record, if intelligently used, will put the cement industry on a scientific and economical basis heretofore unknown.

The Union Company Elects Officers.

KANSAS CITY, Mo., Jan. 15.—At the annual stockholders' meeting of the Union Portland Cement Company at the company's offices, 318 New York Life Building, Kansas City, Mo., held yesterday, the following officers and directors were elected: K. C. Barton, president; R. C. Patterson, first vice-president and general manager; A. Henley, second vice-president; W. B. Lydenberg, secretary; J. H. Rush, treasurer. Directors: T. J. Anderson, Gas City, Kan.; Guy C. Barton, Omaha, Neb.; K. C. Barton, Omaha, Neb.; Louis F. Boder, St. Joseph, Mo.; C. S. Jobes, Kansas City, Mo.; A. Henley, Lawrence, Kan.; Joab Mulvane, Topeka, Kan.; R. C. Patterson, Kansas City, Mo.; Frank Riddle, Iola, Kan.; J. H. Rush, Kansas City, Mo.; T. B. Sweet, Topeka, Kan.; John Townsend, St. Joseph, Mo.

The company is now securing plans and specifications with a view to immediately placing a contract for the erection of a first-class, up-to-date Portland cement mill, of a daily capacity of 3,000 barrels, on its grounds at Iola, Kan.

J. B. Speed & Co. have taken advantage of the recent lull to install the new machinery in their Portland cement plant at Speeds, Ind.

The Nazareth Cement Company will resume operations at their plant at Nazareth, Pa., on February 3, giving employment to about 1,000 men.

Thomas B. Lockwood, of Buffalo, has just sold the Akron cement works to Lewis Belger, contractor and builder, for $3,800. Ten years ago this property, which produces natural cement, would have brought over $80,000. The works have not been used for three or four years.

J. M. Edwards of Lewiston, Idaho, is the prime mover in the West Coast Portland Cement Company, whose headquarters are at Seattle, Wash. The company's holdings are just above the mouth of the Grand Ronde River, partly in Washington and partly on the Idaho side of the Snake River, where a cement plant with a capacity of 1,000 barrels daily will be erected. Ground has already been broken.

The Seaboard Portland Cement Company have broken ground at Alsen, N. Y., and have placed orders for a portion of the machinery, among which are six 608 water tube boilers from the Ruston Boiler Company, Pittsburg, Pa., and forty-five 42-inch Fuller Lehigh pulverizer mills for their clay, raw material and clinker. The plans of the company have been made to cover a mill with a capacity of 6,000 barrels a day.

F. H. Lewis of Staunton, Va., is the consulting engineer for the Maryland Portland Cement Company, now erecting a 2,500-barrel plant at Hagerstown, Md. Mr. Lewis also planned and erected the plant of the Standard Portland Cement Company, at Leeds, Ala., which has been running satisfactorily since its start. The officers of the company are De Courcy W. Thom, president and treasurer, and Loring A. Cover, secretary, with offices in the Equitable Building, Baltimore, Md.

The organization of the Saylor Portland Cement Company, the personnel of which includes Wm. H. Harding, president, and Samuel Y. Heebner, treasurer, of the Coplay Cement Manufacturing Company, Penn Building, Philadelphia, Pa., brings again into prominence the name "Saylor," the cornerstone of the present gigantic industry. It is a fitting tribute that the surname of the founder of the American Portland cement industry should again appear, now that the child then in its swaddling clothes has become a giant.

At the eighth annual meeting of the Alpena Portland Cement Company, held at Alpena, Mich., January 13, the following officers were elected: President, Herman Besser; vice-president, C. H. McKim; secretary, C. H. Reynolds; treasurer, W. H. Johnson; auditor, F. W. Fletcher. Directors: Frank W. Gilchrist, F. W. Fletcher, P. Culligan, J. H. Cobb and George R. Nicholson. The company have enjoyed a prosperous year. At present the mill is shut down for repairs, but it is expected to be in operation by the first of February. Martin T. Roche of St. Paul, Minn., will look after the interests of the company in the Northwest during the present year.

For the Retailer

The National Builders' Supply Association

Meets Semi-Annually.

OFFICERS:

GORDON WILLIS, St. Louis, Mo. ..... President
CHAS. WARNER, Wilmington, Del. ..... Vice President
G. O. PERKINS, Des Moines, Iowa. ..... Vice President
H. H. HALLIDAY, Cairo, Ill. ..... Vice President
E. A. BRADSHAW, Indianapolis, Ind. ..... Vice President
OWEN TYLER, Louisville, Ky. ..... Vice President
JOHN J. KELLEY, Baltimore, Md. ..... Vice President
JAMES A. DAVIS, Boston, Mass. ..... Vice President
E. E. EVANS, Bay City, Mich. ..... Vice President
JOHN WHARRY, St. Paul, Minn. ..... Vice President
P. J. DAUERNHEIM, St. Louis, Mo. ..... Vice President
C. W. ENNIS, Morristown, N. J. ..... Vice President
J. J. MANDERY, Rochester, N. Y. ..... Vice President
G. H. GENGNAGEL, Dayton, Ohio. ..... Vice President
LUTHER KELLER, Scranton, Pa. ..... Vice President
B. L. GROVE, Washington, D. C. ..... Vice President
R. W. MARSHALL, Wheeling, W. Va. ..... Vice President
PETER FISHER, JR., Kenosha, Wis. ..... Vice President
C. J. WATERHOUSE, San Francisco, Cal. ..... Vice President
V. H. KREIGSHABER, Atlanta, Ga. ..... Vice President
J. R. McCORMACK, Greensboro, N. C. ..... Vice President
C. M. KELLY, Providence, R. I. ..... Vice President
J. C. LOVELACE, Memphis, Tenn. ..... Vice President
A. C. GOWER, Greenville, S. C. ..... Vice President
HARRY W. CLASSEN, Baltimore, Md. ..... Treasurer
HARRY S. WEST, Toledo, Ohio. ..... Secretary

Official Organ, ROCK PRODUCTS.

National Builders' Supply Association.

The 1908 convention of the National Builders' Supply Association will be held as announced in former issues of ROCK PRODUCTS, at the Auditorium Hotel, Chicago, Ill., February 4 and 5.

The first day's session will be called to order at 10:30 a. m. Mayor Fred A. Busse of Chicago will welcome the delegates. They will also be greeted by President James A. Hogan on behalf of Chicago Builders' Club. President Gordon Willis will respond. An executive session of the association will be held at 2 p. m. Tuesday evening there will be a vaudeville performance at one of the theaters, which the party will attend *en masse*.

At Wednesday morning's executive session H. H. Halliday, Cairo, will talk on "The Benefits of the Association to Dealers;" J. J. Haas, Pittsburg, on "The Future of Our Association," and Richard Kind, Toledo, father of the association, will give an address on the subject "Love Thy Fellow Man."

There will be another executive session at 2 p. m., for which the program is as follows: Address by A. B. Meyer, Indianapolis, on "The Relative Position of Retail Dealers to Manufacturers and Vice Versa." Howard McCutcheon, Kansas City, Mo., will talk on "Credits," and Robert Lake, Jackson, Mich., on "Harmony." M. L. Fugit, Chicago, will give an interesting address on "Mutual Insurance."

Wednesday evening at 8 o'clock the first annual dinner of the association will be held in the banquet room of the Auditorium. The toasts for that occasion will be presented by Senator A. J. Hopkins. Congressman Lorimer will discuss "Lakes to the Gulf Deep Waterways." President Hager of the Universal Portland Cement Company, will talk on "Modern Methods." A. L. Avery of the United States Gypsum Company will have for his subject "Progress of the Age." Charles Weiler of Milwaukee, "The Cure for Hard Times." Charles Warner, Wilmington, "How to Make Price Associations Legal." Judge Ninah H. Welch will respond to "Chicago." J. G. MacFaydean of the American Sewer Pipe Company will do the honors for "The Salesman."

On Thursday the party will be taken on a trip to the Universal Portland Cement Company's plant at Buffington, Indiana. The route will be announced in the daily edition of ROCK PRODUCTS.

Northwestern Lumbermen's Association.

MINNEAPOLIS, Dec. 17.—The eighteenth annual meeting of the Northwestern Lumbermen's Association was held here January 14, 15 and 16. There were several hundred dealers present from all sections of the great Northwest. The meetings were held at the City Hall, and all the sessions were well attended. The following officers were elected for the ensuing year: President, M. T. McMahon, Fergus Falls, Minn.; vice-president, C. A. Finkbine, Des Moines, Ia. Directors: R. H. Burnside, Oskaloosa, Ia.; J. W. Barry, Cedar Rapids, Ia.; O. C. Searles, Hillsboro, N. D. Secretary, W. G. Hollis, Minneapolis.

As the convention meetings were held in the City Hall, there was no particular hotel or hall selected for headquarters, although the Lumber Exchange was made the principal rendezvous. Many supply and wholesale concerns had exhibits at different hotels, where they showed their products and met their customers.

The Atlas Portland Cement Company kept open house in one of the parlors of the West Hotel. The reception committee consisted of Thomas Magiff, Frank Bailey and F. P. Potter.

The Iowa Hard Plaster Company of Fort Dodge, Ia., was represented by President Roy Merrill and Walter Smith. They passed out note books to their callers.

The Marquette Cement Manufacturing Company held forth at the West Hotel. William Dickinson, general sales manager, was on hand, assisted by Irving Burgh. They handed out souvenirs and entertained the visitors with their automatic canary bird.

The Mankato Cement Works of Mankato, Minn., who manufacture a bricklayers' cement, were represented by the Carney Brothers, who held forth at their offices in the Lumber Exchange.

B. F. Pay of Fowler & Pay, the well known building material people of the Northwest, was on hand, giving the glad hand to his company's customers.

The Kettle River Quarries Company kept open house at the offices in the Security Building. Many dealers are carrying as a side line their rubble, crushed and building stone.

The Marblehead Lime Company was represented by Douglass Howe. Conventions are Mr. Howe's long suit, and there are few of his company's customers in this section that he isn't known to personally.

The Plymouth Gypsum Company and the Plymouth Clay Products Company of Fort Dodge, Ia., had an elaborate exhibit at the West Hotel with a large force of salesmen in charge. President L. E. Armstrong headed the contingent, assisted by J. T. Garland, D. E. Roberts, M. N. Espey, H. J. Osterlund and F. M. Cougil. They passed out a watch fob for a souvenir.

The Cardiff Gypsum Plaster Company were represented by their genial president, Thomas Breen, assisted by C. L. Ward and O. Ottosen. These gentlemen handed out a very pretty watch fob with a Swastika design.

The Universal Portland Cement Company had headquarters at the West Hotel, where E. J. Sigwalt and C. J. Dowdall dispensed hospitality. At their local office J. C. Van Doorn, Northwestern sales manager, assisted by E. S. MacGowan and H. M. Quayle, welcomed customers.

The Northwestern States Portland Cement Company, whose mill at Mason City, Ia., is now getting into operation, were on hand and had a fine display at the West Hotel. The force in charge were Vice-President W. H. L. McCourtie, Sales Manager H. B. Hasbrook, E. A. Coates and F. M. Penninger. This is one of the Cowham System mills and a model in construction and equipment.

Of the large force of the United States Gypsum Company who circulated among the delegates a ROCK PRODUCTS representative noted S. C. Chambers, H. W. and F. W. Farrington, G. R. Murray, H. E. Randolph and C. H. Newman.

The Northwestern Lime Company was represented by John McWhorry and R. D. Turpen. They welcomed their customers in the parlor of the West Hotel.

The American Independent Gypsum Company had a fine display. Their president, B. H. Ward, was on hand, assisted by Sales Manager J. Mericle and T. H. Ewing. They presented watch fobs to their visitors.

THE ILLIONIS CONVENTION.

Annual Meeting in Chicago of the Retail Building Supply and Lumber Interests.

The retail building supply and lumber interests of Illinois will hold their annual meeting at the Casino, corner of Wabash Avenue and Peck Court, Chicago, during the second week of February. It will be the eighteenth annual meeting of the Illinois Lumber Dealers' Association in connection with the second annual meeting of the Illinois Masons' Supply Association. There will be an exposition of building materials February 10 to 15, and business sessions will be held on the 11th, 12th and 13th.

Arrangements have been completed for the exhibition of every item of building material required for the construction of a towering sky-scraper or the building of a modest cottage. Manufacturers and dealers from all parts of the United States have already contracted for floor space, and of the total, aggregating 15,000 square feet, about 11,000 feet has been assigned. Many of the concerns which have arranged for exhibits will present demonstrations of various manufacturing processes and the utilization of their product in a manner which will not only be of interest to the trade but also to the general public.

Everitt Hogle, the general manager, is preparing a number of interesting features, and special events for each day in the week. Among the attractions already booked is a concert band which will give programs every afternoon and evening.

During the progress of the exposition a number of conventions will be held by the trade organizations in the Casino hall. Delegates from practically every producing State will attend these conventions. Meetings will be held by the National Sash and Door Salesmen's Association, Illinois Masons' Supply Association, Illinois Lumber Dealers' Association, Decatur Lumber Dealers' Association and others.

There will be special days for the architects, contractors, wood-workers, masons, tile-workers and other classes of trade workers, and addresses and lectures will be features of certain specified evenings. Postmaster D. A. Campbell will lecture on the parcels post, Prof. J. J. Richey, assistant professor of chemistry at the University of Illinois, will lecture on the cement industry; J. J. Healy, State's Attorney, will lecture on the conspiracy laws as applied to trade unions and building contractors; T. J. Burrell, professor of botany at the University of Illinois, will give a lecture on forestry, and there will be other similar lectures of an equally interesting character. Mr. Pinchot will probably be present to maintain an exhibit of forestry statistics for the United States Government.

It is expected by the manufacturers and dealers that the exposition will be made an annual event. This will be the largest, most useful and beneficial meeting ever convened by the retail lumber and building supply interests of Illinois. The list of speakers embraces men of note upon subjects of engrossing interest in the public mind, as well as of special interest to the trades directly concerned and in whose special behalf the enterprise is projected.

New Incorporations.

At Seattle, Washington, the Northwestern Sand, Lime and Brick Company has been incorporated. Capital, $150,000. Incorporators: C. O. McKee, S. C. Douglas and W. A. Kinney.

At New York City, N. Y., the Robert Rossman Company; capital, $80,000. Incorporators: Robert Rossman, 155 West Twenty-fourth Street; Adolph Rossman, 196 Riverside Drive; George L. Esp, 54 West Ninety-third Street, all of New York.

At Brooklyn, N. Y., the McLaughlin-Hannon Construction Company; capital, $6,000. Incorporators: Henry T. McLaughlin, 614 East Eighteenth Street; Thomas P. Hannon, 654 Carroll Street; Eugene A. Dupre, 338 Linden Avenue, all of Brooklyn.

At Manhattan, N. Y., the Home Builders' Company; capital, $100,000. Incorporators; M. P. Meilby, Brooklyn; H. C. Ball, New York City; A. Ricca, Brooklyn; A. Aaronstein; G. R. Benoit, New York City.

At Chicago, Ill., the McLaughlin Building Material Company, 122 South Clark Street; capital, $10,000. Incorporators: Frank E. Ryan, Daniel Malloy and James Hayes.

THE OHIO CONVENTION.

Second Annual Meeting of the Ohio Builders' Supply Association at Columbus.

The second annual meeting of the Ohio Builders' Supply Association was held at the Great Southern Hotel, Columbus, Ohio, Jan. 23 and 24. President W. A. Fay called the first session to order at 2 o'clock Thursday afternoon. A carefully prepared program had been arranged by the president and secretary. The meeting was attended by about eighty members, all enthusiastic, and the sessions throughout were marked by unusual interest. It was generally conceded that the past year had been a prosperous one for the dealer in spite of the financial crisis which marked its closing months, and that 1908 looks, at this time, as though it will compare favorably with any previous year.

The first paper Thursday was on "Mining Gypsum Rock and Manufacturing Plaster," by W. E. Shearer, sales manager for the Ohio district of the United States Gypsum Company, Cleveland, Ohio.

MINING GYPSUM AND MANUFACTURING PLASTER

By W. E. Shearer.

The development of the gypsum business during the past fifteen years has been beyond the expectations of any of those engaged in the industry. At one time it was thought the only plaster of paris (as it was called) of any value was produced in France, and for your information I wish to state that today France leads in the production of gypsum and gypsum products. But as in every other similar instance we Americans determined that this should not be the case and begun to develop gypsum deposits for the manufacture of different classes of plaster in this country.

The first well known deposits of gypsum used in America were found in Nova Scotia. That country contains deposits of gypsum from one end to the other and millions upon millions of tons. There is no end to the supply. Some of it is more or less difficult to obtain and transport to a market, but the available deposits of gypsum in Nova Scotia are extremely large and enough to supply the demand on it for centuries.

However, Nova Scotia was a little too far away to suit us, and as the demand for plaster begun to increase we begun to learn of and develop our deposits. We will not discuss this in detail other than to state that the most valuable deposits now being worked are in Iowa, Kansas, New York, Michigan and Ohio; in quantity as in order named. Outside of these States a very pure quality of gypsum has been found in the State of Virginia, near Saltville. There has also been discovered a very good grade of gypsum in Florida. We then go further west and fine gypsum in almost all the States west of Kansas and Nebraska, notably Colorado, Wyoming, Nevada, Arizona and California. Some small deposits in the States of Oregon, South Dakota and Montana. In some of these Western States there are regular mountains of practically what is known as pure gypsum rock. The analysis shows a very small per cent of impurities. It has practically no value, however, owing to its not being accessible to a market. There is also another material which is often termed as gypsum, but properly known as "Gypsite," or commercially known as mud plaster, found in the States of Oklahoma, parts of Kansas and Northern Texas. These deposits are low in analysis, but produce a fairly good product for certain purposes for which it is intended or used.

A pure gypsum rock analyzes about 79½ per cent calcium sulphate and 20½ per cent water of crystallization. Now of all the deposits I have referred to there are comparatively few of them that analyze nearly pure, but on the other hand a great many deposits in the State of New York will run as low as 50 per cent in calcium sulphate and 20 per cent water of crystallization, and the balance impurities—silica or similar substance that has no value in the production of plaster. The "Gypsite" of the Southwest will analyze from 50 to 70 per cent calcium sulphate and the balance will be composed of water and usually clay.

That which interests you as Ohio dealers is produced in Northern Ohio and Michigan. Grand Rapids, Mich., was one of the first deposits developed in this section, and as a rule is fairly pure, although we find from 2 to 4 per cent impurities in the Grand Rapids deposits. The greatest trouble we have to contend with at Grand Rapids is the question of water. We will sink a shaft, open a mine and everything work along nicely until we make a blast in mining, and the first thing we know we have opened an underground stream of water which will suddenly flood the entire mine. This stream varies in size, but is always big enough to cause any amount of trouble and expense.

At Alabaster, Mich., we find a purer gypsum than at Grand Rapids. Very little impurities of any description in that deposit, although the undeveloped deposit of gypsum in that vicinity is very limited.

As you are no doubt aware by this time, the deposit of gypsum in Ohio is quite extensive. For years Mr. Marsh owned and operated the only mill in Ohio, but as the demand for plaster increased, further investigations were made. The entire section near Sandusky, Ohio, was drilled for gypsum and a great deal of it found, but it developed in the search for it that the deposit was rather uncertain as to quality. So far as we are concerned, we endeavored to secure gypsum from other veins than that which we were working, on account of economy, but found that there was nothing in the section equal to the old Marsh vein, and while it incurred additional expense to work it, we invariably returned to the original vein owing to the quality of gypsum we were able to procure.

Gypsum is mined or quarried according to conditions. Again referring to Northern Ohio, Mr. Marsh for years and years adopted and followed the expensive process of stripping about fifteen feet of earth from the gypsum rock in order to then quarry the rock. We have abandoned that plan by mining process.

The thickness of the vein of gypsum varies according to localities. Again referring to the Nova Scotia deposits, they are usually secured by quarrying and they have there a face of gypsum anywhere from ten to sixty feet without going down in the earth very far, as it is largely in hills.

The best gypsum in New York is found by sinking a shaft about seventy-five or eighty feet in the ground and then we find a vein from four to five feet thick. This is difficult and expensive mining, but we procure a very good grade of rock. In New York State there are other deposits of rock that are much easier obtained but run very low in analysis. We have a quarry at Union Springs, N. Y., where we have a face of thirty-five feet, but the purity of the rock is about on a par with that which is found at Garbutt and Wheatland, which run about 50 to 60 per cent calcium sulphate.

Where gypsum is quarried the usual process is followed. Where it is mined about the best comparison I can offer you is coal mining. You sink a shaft to the vein and then mine the rock in chambers, using explosives to get it in shape to transport to the mill.

The fact that the use of gypsum in this country has increased from practically nothing or something over 100,000 tons in 1890 to nearly 3,000,000 tons—a fair estimate for 1907—tells you quickly the rapid strides in the use of gypsum in this country for different purposes and the necessity for improved machinery for mining the rock and converting it into a usable material.

Twenty years ago, throughout the Central and Western States, gypsum for wall plaster purposes was scarcely thought of. Throughout the State of Ohio, fifteen years ago, I remember very distinctly that I used to feel good when I could get from some of you people, or your predecessors, an order for fifty bags of wall plaster. Fifteen years ago a plaster mill in this country that would produce fifty tons of plaster per day was considered a good one. At that time a plaster mill in this country was built and operated for the sole purpose of manufacturing a plaster for finishing purposes only. I need not take any of your time to tell you the difference in the conditions then and now, but will tell you something about what this condition has made necessary from a manufacturing standpoint, and I can do this by very briefly describing one modern plaster mill.

W. A. FAY, CLEVELAND, O.
Reëlected President of the Ohio Builders' Supply Association.

In the first place, after the rock is taken from the mine and put on the little cars for that purpose, it is conveyed to the mill, usually by electrical power, and dumped into a large hopper built for that purpose, at the bottom of which is what we call a crusher or nipper. The rock at this point is in pieces varying from ten to fifty pounds. It goes through this crusher producing rock about the size of a walnut. From there it is conveyed to a rotary dryer. We find the most effective and economical, a dryer forty feet in length and six feet in diameter. The purpose of putting the rock through this dryer is to take away all free moisture in order to grind it more evenly. Before the dryer was adopted some of the rock would go to the grinders in a wet, tough condition and some in a fairly good condition, resulting in a very uneven grind of material. As these pieces come from the dryer they are all about the same condition as to the containing of free moisture. It then goes into what is known as a pot crusher for the purpose of pulverizing to a degree of fineness sufficient for the burrs to properly handle. It is then conveyed to the different stone burrs and there ground to the fineness of plaster as you know it. You then have what you know as land plaster, used for fertilizing purposes. Simply the ground gypsum pure and simple without treatment.

From these grinders it is conveyed to large bins ready to run into calcining kettles. It is difficult for me to describe the construction of these kettles other than it is found the most economical size is ten feet in diameter and about eight feet in height. Into these kettles are dumped a quantity of plaster and they are so arranged that the heat is evenly distributed. The purpose of the kettle is for the calcining of the plaster, or to be plainer, to boil out of the plaster a certain per cent of that 20 per cent of moisture that is contained in the original gypsum rock. The kettles are heated to a temperature of about three hundred degrees and kept as near this temperature as possible for about two hours, during which time there is driven from the plaster 14 per cent of the 20 per cent of water or crystallization. At the proper moment the gate of the kettle is quickly opened and entire contents dumped into a cooling bin, and it is something of a sight to see the plaster running into the cooling bin. It reminds you of a stream of hot cream. After you have dumped the contents of one kettle, you close the gate and quickly fill your kettle again and proceed in the same way with your next batch.

From the cooling bin the plaster is conveyed into large storage bins overhead. There it is held in storage for shipment as what is commercially known as stucco, or to be run through mixers for the production of wall plaster.

Now in producing wall plaster we have several things to accomplish and some important ones. When the moisture is taken from the plaster it leaves it in condition that it will set in from eight to fifteen minutes by the application of moisture. As you know, plaster setting in that time would be entirely worthless to you for wall plaster purposes. It is necessary to treat it in order to give it the proper set and to give your mechanic time to apply it to the wall.

Setting of plaster is caused by crystallization—one little crystal forming and another, then another, and around each one of these hundreds and thousands of others until they come in contact with each other and you finally have the solid body. This crystallization is started by moisture and just so soon as you apply moisture of any kind to plaster, unless you have something to offset the crystallizing process, then you have your plaster setting. We accomplish this by the use of a material to keep these little crystals separate—usually some organic matter. Some plaster manufacturers will tell you that they treat the plaster chemically—in fact, I have told a lot of you fellows that same thing—but it is simply a process of putting in the plaster something that will keep apart little crystals that will form after the application of moisture. Now, just so long as this organic matter that you put in the plaster is effective, just so long you avoid the setting of your plaster. Bear in mind that this "chemical" has only a certain amount of strength and is effective just long enough to withhold the setting of plaster in order to make it possible to work it on the wall, and the value of the plaster, as you receive it, depends very largely upon the proper calcination, the evenness of this organic matter and the care in its distribution throughout plaster in mixing it. I will have something more to say about this later.

This substance I have just been discussing is one of the ingredients of the plaster you receive. In making the cement plaster you draw from the stucco bin a certain number of pounds of stucco, put in a certain number of pounds of this "chemical," a certain amount of hair fiber and two or three other ingredients, according to the ideas of the manufacturer—and drop the whole mixture into a machine where it is thoroughly and rapidly mixed for several minutes. From there it is drawn into bags of 100 pounds each, as you know, ready to be tied, tagged and shipped to you. This same system is followed in making wool fiber and sanded material by changing the mixture according to the class of material you desire made.

Now one word more about the crystallization proposition. No doubt all of you have been cautioned time and again by plaster salesmen to be careful about your warehouse—to keep it dry and keep moisture from plaster, to have air space beween the plaster and the earth. You can certainly see by what I have said why this is necessary. I have said that after the calcining of plaster, what you need to start the setting is moisture. It makes no difference whether that moisture comes from a bucket of water, the air or the ground. If you have a warehouse that will permit rain to blow in on your plaster or to draw moisture from the ground, then the plaster has obtained sufficient moisture to form those little crystals which start the setting. Then when you haul that plaster from your warehouse to the job you are furnishing and your plasterer mixes it in his mortar box, the first thing you hear of its setting so quickly you cannot apply it to the wall, and about the first thing we hear is a telegram: "Last car of plaster no good. Send a man quick."

We do not say that all complaints are on account of poor warehouses. We do not say that all plaster shipped from the mills is perfect, but we do say that if you don't avoid the forming of these crystals in your plaster before the proper time, you are going to have trouble when you come to apply your plaster.

Now you can form these crystals in more ways than one. They are not formed entirely by applying moisture to your plaster, but you can supply the plaster with the initial crystal by little particles of foreign matter. You can use dirty water, and the dirt in your water will form the initial crystal, which will quickly start others, and the first thing you know the entire plaster is setting before you can possibly avoid it. You can cause it by using impure sand, or it is very, very frequently caused by using dirty mortar boxes, where there has been dry scales of lime on the sides of your box which fall into your bed of plaster when mixing and quickly forms the necessary crystals to set the plaster before you desire it.

I could stand here two hours telling you incident after incident of my own experiences where I have gone, in response to some telegram, to look after complaint on material quickly setting and have found some little thing in the mixing wholly the cause, or the condition of the plaster in the warehouse, or some trivial matter that caused the entire trouble, and have satisfied the user after explaining the nature of the material, the cause of his trouble, and showing him how to avoid a recurrence.

Plaster is a delicate material. Its nature is such that it must be treated properly, and so far as we are concerned we have gone to a great deal of expense inaugurating a system of watching every batch of plaster we make, by thoroughly testing every batch in our laboratory and trying to educate our trade to the proper warehousing of the plaster so that it will reach the user in the proper condition.

We understand that our success is identical with yours; your interest is ours. If we can give you a good plaster and get you to work with us in properly handling this plaster, we will both be satisfied and successful. There is no plaster manufacturer that is square and honorable who will ask any one of you to receive and accept a defective car of plaster. At the same time let us be convinced that there is not one of you that will expect us, as manufacturers, to reimburse you for a perfect car of plaster on account of imperfect handling. We realize that the legitimate channel for distributing material is through you as a dealer. We realize and have realized that in order to make you become interested in our commodity we must do two things. The first thing, to create a demand for our plaster; the next to give you the product that will

satisfactorily supply the demand, and if you as an organization or as individual dealers will co-operate with the manufacturer who is furnishing you your material with the object of producing the kind of material your trade demands, you may rest assured that your manufacturer will very quickly meet any reasonable demand you may make and do everything in his power to assist you as a dealer to handle his material on a profitable basis.

The second paper was by C. L. Johnson, sales manager of the Castalia Portland Cement Company, Castalia, Ohio, who talked on "Contracts and Trade Conditions." Mr. Johnson is so well known in the trade that he needs no introduction to our readers. He has been in the business for many years, and at the fifth annual meeting of the American Association of Portland Cement Manufacturers recently held in New York City he was elected secretary. Mr. Johnson said in part:

I have been engaged in the manufacture of cement for fourteen years and have always found it a difficult matter to size up the situation so early in the season. There are three classes of salesmen in cement business today. First, there are those who have been in the business ten or fifteen years. They have very little to say regarding the cement situation, and they have made up their minds that they do not know anything about it. Secondly, we have the man who has been in the business four or five years. He thinks he has the situation sized up very accurately. Third and finally, we have the man who has been in the business but one year. He thinks he knows it all and is not open to any conviction in the matter. These are the ones who do harm to the Portland cement business.

Referring to the subject of contracts, I know of some presidents of different cement companies who have taken as their motto, "A contract is a contract." Many dealers who order a thousand barrels for a season's delivery at a price which they consider fair break or cancel their contract if some other manufacturer offers them his cement at 5 cents less on the barrel. This dealer will inform the manufacturer with whom he has his contract that he must reach this reduction, and if not the contract must be void. On the other hand, if the price of cement should be advanced, the manufacturer is held by his word of honor and contract to deliver to the respective dealer any number of barrels of cement due on the contract agreed upon between the dealer and manufacturer. This is an injustice and a wrong to any manufacturer, and the dealer who is a party to any contract should live up to it the same as he would expect of the manufacturer.

I know of one concern, the Toledo Builders' Supply Company, who, when they make a contract for cement, will live up to it, even should the market drop fifty cents on a barrel. I simply mention this company as one instance, as I am thoroughly acquainted with their methods of doing business. Therefore, I say, that when a dealer makes a contract he should live up to it, regardless of the condition of the cement market.

Mr. Johnson continued that the salesmen had formed an association and most of the salesmen were members of it with the exception of the representatives of four concerns. He suggested that in the future salesmen should be known as "sales representatives," since it is impossible for salesmen to drop in on the dealer at the psychological moment. A great deal of blame, he said, was placed upon cement manufacturers when they were not solely responsible. He cited the case of a dealer who had sold ten barrels of cement and five barrels of plaster, along with other material. The contractor employed these ten barrels of cement and five barrels of plaster in the construction of a sidewalk, together with the required amount of sand. A short time afterward the work proved very unsatisfactory. The blame came on the manufacturer of the cement, the contractor claiming it to be an inferior article. Mr. Johnson continued:

Regarding the market conditions for 1908, the money market has been in a precarious condition, which has had its effect on the marketing of product. It has been a very hard and difficult task, under existing circumstances, for us to make a fair estimate of what the year holds for us, but I feel certain that we, as well as every other manufacturer in the land, will have as prosperous a business as that of 1907.

FRIDAY, JANUARY 24.

The gavel fell at 10 o'clock Friday morning, the meeting being called to order by Mr. Hunter, in the absence of President Fay, who was confined to his room by sickness.

This session was taken up by the report of the committees and general discussion. The most important subject was that of the relationship of the manufacturer and jobber to the retail dealer, and of the retail dealer to the manufacturer and jobber. Many interesting points were brought out in this discussion and much benefit was derived therefrom.

The legislative committee on lien laws presented a report submitting the views of prominent Ohio attorneys, who held that the constitution of the State of Ohio will have to be changed to secure the proper lien law. On motion, this report was accepted, and as no further action could be taken the committee was discharged.

The subject of an outing, similar to the one held last year at Sandusky, was discussed, and on motion the matter was left to the executive committee for final arrangements. It is the desire of many members that the association hold its summer meeting at the Victoria Hotel, Put-in-Bay, the first week in August.

On account of President Fay's illness his address was omitted from the program. Secretary Thompson in his report said:

Not quite two years have passed since the formation of this organization in this very room. Those who were present at the initial meeting firmly believed that much good would result from such an association. I really believe that all still possess the same opinion. I am glad to state that at present we have an active membership of eighty, as well as eleven associate members. This shows a very substantial gain over the membership of our enrollment of just one year ago. I think that if we all put our shoulders to the wheel and advertise the progress which our association has so far made, by the next annual meeting we shall have at least 150 members.

I say "progress made" because from my own observation I know that quite a good many dealers of this State, who have not as yet become identified with our association, have become imbued with our ideas and principles, and it will not be long before they begin to take a strenuous part in our undertaking. Several representatives of manufacturers have told me that a State association similar to ours can accomplish far more good than a national organization that is not thoroughly composed of the smaller retail dealers throughout the country as well as the larger dealers. The smaller dealers throughout any State are so numerous that they actually distributed as much, if not more, materials, such as lime, cement and plaster, among the different contractors in their locality, than the dealers in the larger cities. It is simply a case of getting the cart before the horse when you think of a national association being formed before any State association, instead of the national association being composed of the State associations.

We have had several complaints to handle during the past year regarding the selling of different materials by the manufacturer direct to the contractor. I have with me the correspondence in one case which I will read to you, to give you some idea of what we are trying to do to aid the dealers throughout the State.

Treasurer D. E. DeVille reported that there was a substantial balance on hand.

D. K. THOMPSON, COLUMBUS, O.
Retiring Secretary Ohio Builders' Supply Association.

The election of officers for the ensuing year resulted as follows: President, W. A. Fay, The Mason Supply Company, Cleveland; secretary, Bert Graham, The Mason Supply Company, Cleveland; treasurer, D. E. DeVille, Toledo Builders' Supply Company, Toledo; first vice-president, Frank Hunter, Columbus Builders' Supply Company, Columbus; second vice-president, George H. Junod, Athens Lumber Company, Athens; third vice-president, J. B. Van Wagner, London; fourth vice-president, M. N. Townsend, Zanesville; fifth vice-president, M. L. Branyon, M. L. Branyon & Bros., Mansfield. Executive committee: Geo. H. Gengnagel of Schaeffner & Gengnagel, Dayton; D. K. Thompson, Columbus Builders' Supply Company, Columbus; J. W. Thomson, Coshocton, and W. J. Wise, New Philadelphia.

President Fay upon taking the chair made a few remarks. He suggested local organizations in every locality. At the same time it might be well to form a clearinghouse credit association for the protection of the members. President Fay does not look for any great amount of business during 1908, but thinks matters will be normal.

All the newly elected officers present at the installation gave short talks, thanking the members for the honor and the confidence bestowed upon them, each declaring he would do all in his power to upbuild the association and secure additional members and to make the next annual meeting one of great importance to all. After a general talk the association adjourned to meet at the Southern Hotel, Columbus, Ohio, next year, the date to be chosen by the executive committee.

NOTES OF THE MEETING.

The success of the Ohio Builders' Supply Association is greatly due to D. K. Thompson, Jr., who some few years ago conceived the idea of a State association. He took the matter upon himself, and with the assistance of the Columbus Builders' Supply Association set out to learn the views of the builders in the State. His work was so encouraging that he decided to call a meeting at the Southern Hotel of all retail dealers. They met at the Southern Hotel in 1907 and formed what is today one of the best State associations in the country.

Frank Hunter of the Columbus Builders' Supply Association, who is an ardent worker in the State association, may properly be called its "father." There is no more enthusiastic man in this organization.

Don S. Hoover of the Alma Portland Cement Company, Wellstown, Ohio, says he is awaiting developments in the next few weeks before he can definitely determine what the year 1908 holds out. "Trade journals today," he said, "are more conservative as to conditions, and if it was not for these journals the manufacturer and dealer would not be in such close touch. The manufacturers and dealers should get together at least once a year in all the States, if for no other purpose than to have a social time and form new acquaintances. The manufacturer today recognizes the dealer more than at any time heretofore."

P. B. Belden of the Canton Press Brick Company, who joined the association this year, is a young man and enthusiastic in praise of association work. Canton, he said, will be active this year in building. Two or three hundred mechanics will draw their accounts from the savings banks and put them into real estate and building. The Canton Press Brick Company sell through jobbers and agents, and do not want contracts if it is possible to avoid them.

"Uncle Joe" Loeb of the Buckeye Fire Clay Company, Uhrichsville, Ohio, is one of the active association workers. There are few dealers in this section of the country who are not acquainted with Mr. Loeb and who have not had the pleasure of his hearty handshake. He said that nineteen out of twenty dealers who contract for a year's supply will ask for a reduction from their contract price if the prices should drop, and the manufacturer must meet this request. But, on the other hand, if the prices advance on any building material the manufacturer must stand by his contract. Mr. Loeb was accompanied to Columbus by his wife, who took the opportunity to visit relatives. He will leave on a business trip to New York the first of the week.

F. M. Thompson, of Zanesville, said there was no stringency in the money market in his city. Business there has been exceptionally good throughout the year.

F. A. Hunter of the Columbus Builders' Supply Company, Columbus, Ohio, is one of ROCK PRODUCTS' warmest friends. The volume of business in 1907 with Mr. Hunter's firm was large. "The market prices were demoralized," he said, "by reason of the fact that purchases were made on an ascending market and sold on a declining market, resulting in a smaller margin of profit to the dealer. The outlook for this season is most encouraging."

E. A. Evans of the Zanesville Grain and Builders' Supply Company, Zanesville, O., says that his town is one of the few that never get dull. Business had been good and plentiful and during the stringency it had not been necessary to issue clearinghouse checks.

J. W. Smith of the Smith Lumber Company, Portsmouth, contractors and dealers in builders' supplies, will make extensive improvements this spring. They will put in a new planing-mill and double the capacity. This is one of the new firms of the town, established since the Spanish-American war. Captain Smith was discharged from duty in the spring of 1899 and located in Portsmouth, entering the business in which he is now engaged. Among the most important buildings his firm has erected in Portsmouth the past year are the Carnegie Library and the Masonic Temple. Portsmouth, said Mr. Smith, has improved considerably in the last few years and has gained a larger percentage of population in the past three years than any other city in Ohio.

Sales Manager C. F. Hardwood, Charles Schmutz and J. M. Hilands of the Superior Portland Cement Company, Charleston, W. Va., were among the early arrivals. Mr. Harwood reports business very satisfactory, notwithstanding the fact that their mill is one of the newcomers in the cement business. The Superior Portland cement is guaranteed to meet the requirements of the standard specifications adopted by the American Society of Civil Engineers. They are in a position to make immediate shipments and cater to the small as well as the large dealer.

Colonel R. J. Diegel of the Victoria Hotel, Put-in-Bay, Ohio, was in attendance and extended an invitation to the association to hold the midsummer meeting at his resort this year.

The representative of ROCK PRODUCTS desires to express his hearty thanks to the association and to all the members for their kind words and good wishes.

H. F. Rauch of the Whitehall Portland Cement Company, Philadelphia, was circulating among the boys and giving them the glad hand as well as a fine souvenir in the way of a match box.

Ed. Koch of the Castalia (O.) Portland Cement Company is one of the younger members of the knights of the grip. He is a persistent, hard-working salesman. He is also very popular with the ladies.

Thursday evening the association attended the theater party at the Southern. Miss Elsie Janis, a Columbus girl, was on the "boards" for that evening. All were high in their praises of the evening's entertainment.

J. F. Twamley, general sales agent of the Coplay Cement Manufacturing Company, Philadelphia, put in a strenuous time at the convention. Mr. Twamley was enthusiastic over the Buffalo cement show. He will attend the National Builders' Supply Association in Chicago in February.

The Ohio Builders' Supply Association will send out within the next few weeks a full report of this second annual meeting to all dealers in the State with an invitation to become members of the association; also to the manufacturers, inviting them to become associate members.

James J. Donovan of the Alpha Portland Cement Company, Pittsburg, says that the outlook for a good year's business is most encouraging. "Jimmie" makes friends wherever he goes, but there was a downcast look upon his countenance at this session—he simply was lost since his bosom friend, J. C. Neely, has gone and done it—"married."

S. G. Webb, who has just connected himself with the York Portland Cement Company of Portsmouth, with headquarters at Columbus, was in attendance and getting acquainted with the boys. Mr. Webb will represent this company, as well as the Garden City Sand Company of Chicago, in Ohio, Kentucky and West Virginia. He expects to make Portsmouth his headquarters after May 1.

J. C. Neely, representing Miller & Coulson of Pittsburg, gave the boys quite a surprise when he registered "J. C. Neely and wife." This was an unexpected feature of the convention and Mrs. Neely has established a precedent which other brides will do well to follow. Shakespeare says that "a man married is a man marr'd," but Mr. Neely does not look very much "marr'd" yet. Mrs. Neely is a charming young lady. On the happy couple's appearance in the dining-room Thursday evening the waiters were kept busy carrying messages of congratulation.

Diamond rings were given away—at least there was a rumor to that effect—by Charles Brigham of the Atlas Portland Cement Company. The supply was limited, however, and was exhausted before C. J. McCormick, the Columbus representative of the Cleveland Builders' Supply Company, had tendered his card for one. Now, whether Mack wanted the ring for that new daughter who arrived at his house on January 17, or for himself, could not be learned. But Mack is happy just the same and was treating the boys in his usual happy way, all on account of "Ethel Marie." ROCK PRODUCTS extends congratulations and best wishes.

THE ATTENDANCE

W. A. Fay, Masons' Supply Company, Cleveland.
D. K. Thompson, Columbus Builders' Supply Company, Columbus.
R. E. De Vilk, Ohio Builders' Supply Company, Toledo.
F. G. Powell, Cleveland Builders' Supply Company, Cleveland.
G. D. Elwell, U. S. Gypsum Company, Cleveland.
J. L. Carlile, U. S. Gypsum Company, Cleveland.
F. G. Rauch, Whitehall Portland Cement Company, Philadelphia.
E. N. Hanke, American Sewer Pipe Company, Columbus.
D. Shutzer, J. Rapp & Co., Columbus.
Valentine Rice, Chillicothe Coal Company, Chillicothe.
C. J. McCormick, Cleveland Builders' Supply Company, Cleveland.
Neal McGreevy, McGreevy & Ortman, Dayton.
Charles Frank, Columbus Builders' Supply Company, Columbus.
R. S. Rhodes, American Sewer Pipe Company, Columbus.
W. E. Shearer, U. S. Gypsum Company, Cleveland.
M. D. Tolerton, J. G. Tolerton & Son, Alliance.
E. C. Kissinger, Columbus.
S. C. Fox, Grand Rapids Plastic Company, Fostoria.
W. A. McCall, Dealers' Record, Chicago.
C. L. Johnson, Castalia Portland Cement Company, Castalia.
D. S Hoover, Alma Portland Cement Company, Wellston.
O. H. Hemmelright, U. S. Gypsum Company, Piqua.
C. H. Brigham, Atlas Portland Cement Company, Columbus.
O. H. List, Cleveland Builders' Supply Company, Cleveland.
J. J. Donovan, Alpha Portland Cement Company, Pittsburg.
R. S. Beedin, Canton Pressed Brick Company, Canton.
Thomas Sweringler, South Side Lumber Company, Columbus.
M. Montgomery, Wesley Montgomery, Newark.
O. C. Maurer, Woodville Lime Company, Toledo.
E. E. Stillwell, Athens Lumber Company, Bellefontaine.
George H. Janod, Welsly Montgomery, Athens.
Benjamin Montgomery, Newark.
Charles H. Niemeyer, Columbus Coal and Lime Company, Columbus.
A. E. Smith, Crooksville.
Charles Schmutz, Superior Portland Cement Company, Cincinnati.
J. M. Hiland, Superior Portland Cement Company, Pittsburg.
C. L. Harwood, Superior Portland Cement Company, Charleston, W. Va.
J. C. Neely, Miller & Coulson, Pittsburg.
D. A. Randin, Randin Brothers Lumber Company, Athens.
M. A. Maher, Greenville.
F. P. Child, New Lexington.
R. J. Degle, Victoria Hotel (Put-in-Bay), Sandusky.
S. J. Anderson, Anderson & Neap, Urbana.
J. O. Randin, Randin Brothers Lumber Company, Athens.
G. H. Uthrop, Woodville White Lime Company, Toledo.
Howard E. Arnold, Dayton Builders' Supply Company, Dayton.
Richard King, Toledo Builders' Supply Company, Toledo.
Bert Graham, Masons' Supply Company, Cleveland.
William H. Smith, P. Smith Lumber Company, Newark.
S. G. Webb, York Portland Cement Company, Columbus.
G. H. Gengnagel, Schaeffer & Gengnagel, Dayton.
F. M. Cluttee, ROCK PRODUCTS, Chicago.
F. M. Townsend, Zanesville.
A. A. Huber, Piqua.
J. Q. Adams, Coshocton Lumber Company, Coshocton.
Henry Miller, Marietta.
Kent E. Lyman, Jamestown Paint and Varnish Company, Jamestown, N. Y.
E. C. Baker, Diamond Portland Cement Company, Cleveland.
James A. Undine, Lima Plaster Company, Lima.
C. A. Owens, John D. Ancus & Son, Owens, Ohio.
C. F. Miller, Cleveland Builders' Supply Company, Cleveland.
W. W. Blocheon, Wellsburg, W. Va.
C. G. Jones, United States Gypsum Company, Columbus.
E. W. Parker, Hamilton-Parker Company, Columbus.
F. C. Ferris, Ferris Steam Motor Co., Columbus.
C. H. Niemeyer, Columbus Coal & Lime Company.
Henry Smith, Michigan Plaster Company, Chicago.
J. F. Twamley, Coplay Cement Company, Philadelphia.
E. A. Evans, Zanesville Grain and Builders' Supply Company.
H. S. Moorehead, Zanesville.
Welsied Montgomery, Newark.
J. R. Van Vagener, London.
B. W. McCausland, Jr., United States Gypsum Company, Cleveland.
Frank Lowe, F. W. Bird & Son, Walpole, Mass., Columbus.
Charles F. O'Donnell, Buckeye Portland Cement Co., Bellefontaine.
F. E. Bryan, Universal Portland Cement Company, Pittsburg.
J. W. Thomson, with A. H. Thomson & Son, Coshocton.
J. W. Windsor, Houston Bros. Co., Pittsburg.

OUR TRAVELER ON THE COAST.

BY A STAFF CORRESPONDENT.

Los Angeles, Cal.

Among the leading retailers of building materials at Los Angeles are the Western Commercial Company, whose office and warehouse are at 316-324 East Market Street. Charles Marsden, the president, informed me that they handle in case of Portland cement, Alsen brand of German. The following brands of Kansas manufacturers are also carried in stock: Sunflower, Indian and Iola. The Californian brands, Colton, Golden Gate and Standard, were sold by them, together with the Red Devil brand from Utah and the Atlas from Hannibal. In lime they sell four brands of Summit, and they also handle Oro Grande, Puntenney and Grand Canyon. For hard wall plaster they deal in Alpine, Angelus and Holdtite brands. With the exception of the imported, all the foregoing are sold in cloth sacks. Besides the above they handle steel lath, fire brick and clay, roofing felts, building papers and hardwood lumber. Mr. Marsden said that an initial shipment had been made of cement from China, but that the quality being poor it was not likely that it would be found expedient to import any more of it. The importation was made by local contractors. The company has a large two-story warehouse equipped with an elevator which is operated by an electric motor and has Fairbanks platform scales near a railroad switch.

The R. A. Baker Company have at 6050-6064 Pasadena Avenue their office, warehouse and yard. R. A. Baker, president, said he had been engaged in the business of handlings builders' materials at Los Angeles for the past five years. The company sells Iola (Kansas) Portland cement and during the past season their purchases exceeded 8,000 barrels; also Grand Canyon lime, Taylor's hydrated lime, Alpine, Angelus and Holdtite hard wall plaster and United States Gypsum Company's Challenge finish. They have some trade for fire clay, sand, metal lath, etc.

The company has a warehouse 140x30 feet, with a cement floor and a warehouse derrick. A switch track to the railroad is in the rear of the warehouse. Going to their stable, I found they had thirty-six horses, for, in addition to their building materials business, they do considerable general teaming.

The Lyster Lime Company(Inc.) have an office and warehouse at 155 East Jefferson Street. George A. Lyster, president and general manager, said that they deal in Blue Summit lime and Taylor's hydrated; also "Indian" and "Sunflower" Kansas Portland cement, Standard (San Francisco) and Universal (Chicago) brands. For hard wall plaster they sell Alpine, Angelus and Holdtite. Mr. Lyster said they were very busy and had been obliged to hire outside teams in addition to their own.

Mr. Snyder is interested in a kaolin property of 1,480 acres in Custer County, Colo. The kaolin of this deposit is very fine and analyzes the highest of any known samples. The company is incorporated as The American Kaolin Properties, and manufactures pressed brick, fire brick, vitrified brick, roofing tiles, etc.

One of the big lumber concerns of Southern California is the C. Ganahl Lumber Company, whose general office is at 830 East First Street. J. G. Ganahl is a St. Louis man by birth, but has been living here for several years. The business was established in 1884. In all the company control ten yards—four in the city and the rest in the neighborhood of Los Angeles, with the exception of one at Las Vegas, Nev. Besides lumber the company handle "Sunflower" brand of Kansas Portland cement, Grand Canyon lime, Taylor's hydrated lime, and Alpine hard wall plaster. Mr. Ganahl said business was good and the outlook encouraging, for he could not see any cause for concern while railroads were having more freight offered them than they could handle.

S. Kraemer, at Twenty-fifth and San Pedro Streets, was about leaving to keep an engagement. The ROCK PRODUCTS man learned, however, that he has a good business in builders' materials. For Portland cement he handles the Alsen brand, imported from Germany, the Standard, a Californian brand, and the Sunflower; Snyder Lime Company's lime, also Taylor's hydrated; the Alpine and Angelus brands of hard wall plaster. Like others dealing in building materials, Mr. Kraemer says that mostly hard wall plaster is used for interior work. He also handles Douglass Clay Products Company's fire brick and clay, building sand and lath. In his warehouse he has the floor built on a level with the wagon-bed, and a driveway completely through the building. He uses a derrick for loading and unloading his wagons. In my visits among the retailers here I have not seen any cement packed in paper sacks.

San Pedro, Cal.

At San Pedro, the port of Los Angeles, one may get from Light Hill a fine view, not only of the Pacific Ocean, but also of the great breakwater, now nearly completed, which is being built by the Government at a cost of nearly three million dollars.

Calling on James Swinford, I found him at the rear of his warehouse at 324 Fifth Street, overhauling some empty sacks, which he said was a great nuisance, and he would be glad to see paper sacks adopted by manufacturers. He handles German Portland cement principally, because he says it is standard in quality and costs him less than domestic, which comes in at Los Angeles and is then subject to the freight from that city. About two months ago a five-masted vessel landed nearly 40,000 barrels of cement from Germany. This he mentioned in explanation of having so much of it on hand. For bulk lime Mr. Swinford sells Blue Summit and also some of Snyder's. For hard wall plaster the Alpine and Angelus brands. Mr. Swinford showed me his lime house, which is built of three courses of boards, battened with tar paper (this comprises the roof as well). He said the object to be gained was equal temperature as well as keeping out damp air. As a further precaution he lines the tops of the boards with plenty of newspaper, on top of which he places burlap bagging and then lays boards across. He said in this way he can carry lime three months or more without its slaking, and in examining three or four barrels, I found the lime dry and cool. Mr. Swinford has been engaged in the builders' supply business for about fifteen years. At present he found trade quiet, as there was not much building going on.

OBITUARY.

Albert W. Calkins, for ten years general manager of the C. H. Little Company, died on December 29 from a complication of diseases. He was a man well versed in the cement and lime business, his father before him having been in the same trade. C. H. Little placed much confidence in Mr. Calkin's ability and a year ago made him general manager. Mr. Calkins was 46 years old and unmarried. His successor has not yet been appointed, but it will undoubtedly be one of the men now connected with the Little Company. Mr. Calkins was as modest as he was able, and it was probably for this reason that he never had a photograph taken.

THE FOURTH ANNUAL.

The Buffalo Convention of the National Association of Cement Users Marks an Epoch in Industrial History.

The fourth annual convention of the National Association of Cement Users was held in Buffalo, N. Y., January 20 to 25, with all of the most encouraging elements of success and progress that could be possible and centered into such an occasion. The program consisted of a series of papers and lectures by the most eminent and successful structural engineers in the world. The committee reports were drawn up with deliberation and careful study by the foremost contractors, manufacturers and practical experts to be found, and the discussions by which the position of the association was determined in every case were participated in eagerly by the most representative talent.

The great exhibition that filled the immense Sixty-fifth Regiment Armory to overflowing and the lessons to be observed from the improved machines, the perfected materials and improved methods of construction all go to show that the National Association is the band wagon which is leading the progressive army of cement users into greater things and wider usefulness in every part of the country.

The attendance at the convention was representative of the whole country. There was hardly a State in the Union that was not represented by one or more delegates, as was evidenced by the paid admissions into the exhibit hall.

The reëlection of so many of the officers clearly demonstrated an element of harmony which bespeaks the coöperation of all the members in the great association interest has done and still is doing means of personal solicitation and every other proper way, so that the time of the next annual convention practically all the prominent concerns interested in the application of concrete in any of its forms may be numbered upon the rolls.

The great educational feature of the annual convention of the national association cannot be overestimated. When one looks back over the four years of history since the first organization it is hard, indeed, to realize that for the most part these are the same people who made up the Indianapolis convention. There has been so much accomplished in the way of teaching people everywhere how to use concrete intelligently that the machinery people are selling machines now to their first customers. The new lines that have been successfully entered to increase the consumption of Portland cement are wonderful. The fine art feature is being developed rapidly. Porch columns and decorative architectural accessories of every useful description are now accomplished facts. Drain tiles of concrete are made with wonderful speed and more economically than they have ever been made of clay, and, as if to cap the climax, fireproof structural tile of concrete, far superior to anything else of the kind that was ever offered on the market, is on exhibition. This means one more revolution—another victory for cement.

These new features have all been developed in connection with the progress of the association's work. It is hard to tell what yet remains to be introduced and perfected. The great work of educating the masses of the people has only really begun. The leaven concentrated into the circle of association movement to increase the membership by wonders. It is spreading every day, but there is a great mission yet to be fulfilled. Thousands of people who know little or nothing about the value and blessings to the race contained in the Portland cement industries remain to be instructed. Every member of this association is a reader of ROCK PRODUCTS, which means that the staunch old standard-bearer is doing its part.

THE OPENING SESSION.

All the sessions of the convention proper were held in the Concert Hall of the Teck Theater Building. At the formal opening, when President Richard L. Humphrey swung the gavel, there were a goodly number present, and stragglers kept coming in right along until about 200 delegates, interested particularly in the discussion of sidewalk specifications, which was the first order of the meeting, were in attendance.

James N. Adam, Mayor of Buffalo, extended an official greeting to the gentlemen of the association and gave his sanction to the deliberations.

Buffalo is rich in attractions of world interest and has an unlimited number of important enterprises that make her famous among the sisterhood of cities, but beyond all this she has a mayor who is a true representative of the spirit that has made Buffalo great. He is a wit and believes in progress, and was quick to find the great educational suggestion of the national convention. In addressing the convention he said:

Gentlemen: I understand you have come to us with a concrete proposition. Your purpose is to cement our interests with your own, to mutual advantage, and therefore we most heartily bid you welcome to our city.

Cement construction for a while seemed to be one of the lost arts. We used to hear of Roman cement, and when I went to Rome and saw what it was I wondered why it had been superseded. Perhaps it was because builders had found a way to mix it to their advantage and in the end had killed the goose that laid the golden egg. Some people in Scotland say whisky is bad, especially bad whisky, and I am sure there is nothing so bad in concrete as bad concrete.

If our friendships are cemented by unworthy motives they will not last very long. So it seems the real secret of your business is integrity, and, after all, that is the real secret in everything. Your molds may be all right, the separate component parts may be all right, but if the mixture be disproportioned all goes wrong.

"Pray, Mr. Opie, what do you mix your paints with?" "With brains, sir," said Mr. Opie, and he might have added, "with honesty."

You have come to Buffalo with a double purpose—to advance your own interests and to advance ours. This

RICHARD L. HUMPHREY.
Elected President of the Association for the Fourth Time.

is a community of interest that should be encouraged. You have brought with you an exhibit of your materials and appliances that we may have ocular demonstration of the value of your suggestions. Seeing is believing. We shall look with both eyes. For we have an idea that you have got a good thing and something that may be of use to us. We have some good examples of your craft in Buffalo. I hope that ere long we shall have many more. Those we have are spoken of as fireproof, waterproof, weatherproof, insectproof, soundproof, earthquakeproof—proof against almost everything, in fact.

Gentlemen, we welcome you to Buffalo. It is a fine city, and when adorned with a few more cement buildings it may be finer still. Stay with us and put them up. We will sell you the land on easy terms. Do not let your time be all engrossed with business. Take a drive round and see how pleasant a place Buffalo is, and hear some of the fine music which has been provided for during your stay with us. So we shall at least have our acquaintances cemented. Welcome to Buffalo.

President Humphrey on behalf of the association responded in his own apt and graceful way to Mayor Adam's welcome.

The business session which followed was taken up with the usual perfunctory formalities in the way of clearing the deck for action, and the president at the end of the work of the Executive Board announced the following committees by appointment of that body:

Nominating Committee—E. D. Boyer, chairman, Catasauqua, Pa.; John E. Conzelman, St. Louis, Mo.; Robt. C. Morris, Louisville, Ky.; A. J. Maynard, Bridgewater, Mass.; J. F. West, Wichita, Kansas.

Committee on Resolutions—Robert W. Lesley, chairman, Philadelphia, Pa.; M. C. Robinson, Ashtabula, Ohio; A. N. Pierson, East Orange, N. J.; L. V. Thayer, Minneapolis, Minn.; Fred K. Irvine, Chicago, Ill.

George C. Wright, consulting engineer, Rochester, N. Y., was elected permanent secretary of the association for one year.

George L. Stanley, chairman of the committee on streets, sidewalks and floors, with the coöperation of his committee, had prepared his printed set of specifications covering the range of operations included in sidewalk construction. There were many sidewalk men there, each one determined to make the specifications as officially adopted by the association all that they should be. Consequently the discussion of this paper was promptly taken up by a large number of the delegates. E. D. Boyer brought out the importance of making the specifications of a general nature so that they will be applicable in every locality and with every kind of aggregate. He also noted the importance of clean aggregates, saying, "It might be safe to say that all kinds of aggregate should be washed."

George D. Conger of Springville, N. Y., told of his experience in putting in deep foundations for years according to the old-time specifications. He said he first put down some work on his own property by laying good, solid concrete on the firm ground, and it went so well that he had never made any other kind since.

W. H. Dunn of Richmond, Va., said that he had seen much good work without deep foundations. He considered the firm union between top and bottom layers of the work as of the first importance.

W. W. Schouler, Newark, N. J., thought the specifications should state clearly stone and gravel. He started something by mentioning "cinder-concrete."

Few were the advocates of cinder-concrete, although nearly everybody had something to say on this subject.

Robert Mann Wood of Chicago told of his own experiences with Buffalo sidewalks the night before and hoped that other members had not noticed the same thing.

A. L. Bender, Topeka, Ind., called attention to the importance of having the concrete as wet as possible to get the best results in sidewalk work.

Mr. Skinner, an architect, said he was much interested in the discussion, as he had been in the habit of specifying an excavation of eighteen inches in all his sidewalk work. He now finds that this is not always necessary.

After an extensive discussion of the foundation, its composition and its drainage, it was suggested to take up the matter of top dressing, but as the sidewalk subject had merely been opened the president decided that the matter must go over for future consideration. The sidewalk section held several division meetings during the remainder of the meeting, which resulted in the final adoption of the original report of the committee with numerous amendments, which will be carefully transcribed for publication in the near future, possibly in the February number of ROCK PRODUCTS.

EVENING SESSION, JANUARY 21.

Immediately on calling the session to order the president proceeded to read his annual address, which is always one of the most important documents of the convention. He briefly took up the record of the past year and outlined the policy of the association for the future, pointing out the path to even greater usefulness.

Mr. Humphrey's address was delivered orally from notes and is not, as yet, prepared in complete form suitable for publication.

W. K. Hatt, professor of civil engineering in Purdue University, Lafayette, Ind., delivered an illustrated lecture upon the "Elementary Mechanics of Reinforced Concrete." He gave the first principles of concrete construction, together with the structural equations and tests to prove the same in such a clear and concise manner that undoubtedly the majority of his hearers grasped the important subject with a better perception than ever before. Prof. Hatt is a born teacher with the rare gift of imparting all that he gives forth in such a way that the class can easily adopt the thought and the argument.

Unfortunately the lecture of Prof. Hatt was not committed to writing, but consisted of a number of stereopticon views which he used as a test amplifying and explaining the methods and process employed in the teaching of scientific construction. The views showed a number of beams constructed by the students of the class, with accompanying diagrams of the erection of the reinforcement and the methods employed in testing beams together with the best system employed in noting the results of

such tests. The mathematical equations and comparisons were fully analyzed and explained, and deductions drawn in many useful cases which practical contractors frequently have paralleled in their operations. This lecture alone was worth a trip to Buffalo to any practical concrete worker who wants to know the whys of many of the specifications which often look as if they are just put down by the engineer to harass the superintendent of the job. It is indeed a pity that any superintendent or inspector engaged in concrete work should have missed this valuable lecture, which, for the reasons already stated, cannot be reproduced in print.

W. H. Mason, superintendent of the Edison Portland Cement Company, Stewartsville, N. Y., read the following paper:

METHODS AND COSTS OF CONCRETE CONSTRUCTION WITH SEPARATELY MOLDED MEMBERS.

By W. H. Mason.

This method of constructing mill buildings, by casting the members separately and erecting them after they have become sufficiently hard to handle, has been followed by our company for something over a year. During this time we have built two kiln buildings and one clinker storage building.

This paper is an attempt to describe a cement storage building, from which, although not yet completely erected, we can give better details, photographs and costs than on any of the previous buildings. All of the members for the building are made, and now it only remains to finish the erection and a part of the side walls.

The building was designed to hold 350,000 barrels of cement; the over-all dimensions are 144 feet by 360 feet by 30 feet high. On account of the enormous pressure of cement when stored in bulk, the side walls were made in place by the usual method, and are 7 feet thick at the ground line. One end of the building contains 12 bins, the walls of which were also made in place. The columns, girders and roof slabs were cast about half a mile away and brought to the building on railroad cars for erection. The roof, which has an area of over 50,000 square feet, is made of concrete slabs 12'x6'x4". These are supported by concrete girders, which in turn are carried by the columns. There is also an additional row of girders and columns on one side of the building for the purpose of carrying the conveyors, etc., which deliver cement into the building.

For the completed building there is a total of 141 columns, 187 girders and 720 roof slabs.

In preparing to cast the members we set up a ½-yard Ransome concrete mixer at a place convenient for getting stone, and then ran a spur track to it which was connected to the main line of railroad by a switch. On each side of the spur track, which was on practically level ground, we leveled off beds and put 4 inches of cinders on them; then the cinder was wet down and rammed, and concrete 4 to 5 inches thick placed on it. The surface was leveled off and smoothed with a trowel. These casting floors or beds were made of various sizes to suit the members which were to be made on them; the usual size was 10 feet by 50 feet. We had figured that these casting floors would be much cheaper than floors made of lumber. This was borne out by the cost records, which show the beds to cost 4 cents per square foot. This compares very favorably with an account I saw recently of some slabs which were cast in Chicago for street crossings for the Chicago, Burlington and Quincy Railroad. The lumber alone for the floors cost 20 cents per square foot.

The column forms were made of 2-inch lumber planed one side and two edges. They were made 20 inches deep, two inches deeper than the columns, so that in setting up on top of a column previously cast it would clamp 2 inches on the lower column, which would facilitate setting the forms. The yokes used were 2"x6", with a spreader at the top and a ¾-inch bolt through just above the form. We made altogether seven column forms, and with these cast 141 columns. The forms are in good condition now, and could easily be used for as many more columns.

The girder forms are built just like the column forms, and used in the same manner. Only five girder forms were made, and with these we cast 187 girders. Frequently we cast girders with no forms of lumber, and sometimes we used one-half of a form only, as will be seen in some of the photographs.

The roof slab forms are somewhat different; these are made 8 inches deep, with the upper half identical with the lower half, except that it is offset 4 inches endwise. The upper 4 inches was the form proper, while the lower 4 inches is used to clamp on the slab below. The offset is made to enable us to lift the slabs after they are cast. The bevel strips are put on to give the edges of the slab a taper so as to have a place for calking to make a weatherproof joint. Twenty-eight of these forms were made and we have already cast 720 roof slabs, and as we have adopted a 6'x12'x4" roof slab as a standard, we expect to use the forms for many more castings.

The columns are 32 feet long and 18 inches square, with two knee braces extending 18 inches at the top. The reinforcing consists of four ⅞-inch high carbon twisted steel rods with hoops of ¼-inch steel spaced 9-inch centers. The foundations for each column were 5-foot cubes made in place with the socket 20 inches square. The depth of these sockets was left low, and after all foundations were in we grouted up the bottom to the proper height. By this method we made the slope on the roof, which has a pitch of 1 foot in 150 feet. All columns were made the same length. The top of the foundation was reinforced to prevent breaking out. Two pieces of pipe were cast in the top of columns for bolting on the plates which hold the column and girder together.

The girder is of straight rectangular form, 24'x2'-2"x1', reinforced by four ⅞-inch high carbon twisted steel rods with hoops, and two small rounds in the top. Pipes were cast in the ends for fastening to the columns and 2"x2" wood blocks set in at intervals for the purpose of connecting electric wires.

The roof slabs, as before stated, are 6'x12'x4", reinforced with twelve ⅜-inch square rods in the line of its supports. We also used five ⅝-inch square rods crosswise to hold slab together in handling. The edges are beveled ⅝ inch, making an opening of ¾ inch at the top when the roof slabs are in place.

In assembling the building the column is first set in the socket, which has 1 inch clearance all around. It is plumbed, and then wooden wedges are driven in to hold it. A grout of 1 of cement and 3 of sand is then poured in. As soon as this sets sufficiently the wedges are removed and the space filled with more grout.

The tops of the columns and the bottom of the girders where they rest on the columns are soaked with water for some hours before the girders are set in place. This is done by tying burlap on these parts and soaking it. Then a mortar of 1 to 3 is put on top of columns, and the girders set in place, which squeezes out the mortar, making a perfect bed for itself. The roof slabs are then placed on the girders with a mortar joint the same as between column and girder.

We have found with our mixture, which we make very wet, that it is not necessary to waterproof the slabs in any way, as they only show a little dampness for a short while, but the pores soon seal up, which leaves only the joint between the roof slabs to be taken care of. This is done by first calking the taper crack with oakum for about 2 inches deep; then we clean and paint the edges and fill the remaining 2 inches with a composition made of one-third coal tar and two-thirds cement, boiled together and applied while hot. This has proved to be entirely satisfactory and is a very inexpensive filling.

In addition to the mortar joint between the column and girder we bolt on a ½-inch steel plate which connects the two girders to the columns. We believe this is unnecessary, but have put it on as an additional precaution. The roof slabs are not fastened in any way, and we depend upon the mortar joint and their weight entirely.

Plate 1 shows the concrete mixer in position; the spout into the top of the bin comes from a conveyor which carries the crushed cement rock to the stock house. We used the crushed cement rock straight from the crusher; whenever the bin was low we put a scraper on the belt conveyor and scraped off enough to fill the bin. There is a small hopper over the concrete mixer which holds just one batch of stone and cement. The car used for transporting the concrete is standing in position to be filled; it holds about 3 yards.

Plate 2 shows a general view of the yard and casting floors. In the foreground is shown a row of columns with girders cast between them and the reinforcing for other girders which are to be cast, using the sides of other girders for forms.

Plate 3: Here is a lot of reinforcing for columns made up and wired together ready to be set in the forms. These were made up by Italian labor, piece work, at 85 cents each.

Plate 4 shows the method used to prevent the slabs, etc., from sticking to each other. The Italian boy is applying a coat of ordinary whitewash. This was used throughout and found to be very satisfactory. It is necessary, however, to put on quite a thick coat of it. We usually put on two coats as a matter of precaution.

In the background of this plate can be seen the two kiln buildings built after the same method. On these buildings we used sheathing paper as a separator. The objections to paper are that it sticks very closely to the concrete and is hard to remove. Then it is hard to hold in position while casting if there is any wind. It also expands with moisture and sometime folds, leaving the concrete casting irregular. We thought of using a paraffined paper, which of course would do away with the spotted appearance of the castings. This, however, was not objectionable to us, as everything around a cement mill soon comes to the same color. We therefore used the whitewash throughout.

Plate 5 shows the method of filling the slabs. First a few shovels of concrete are thrown in and spread so as to bring the steel within ¾ inch of the bottom; then the steel rods are laid on this, the gate on the car opened and the concrete flows out; the concrete is made very wet and will flow readily. Slabs that were filled one day were whitewashed the following morning and the forms raised; in the afternoon another slab was cast on top.

Plate 6: This shows a set of girders and columns, some of which have been raised ready for loading. The columns here are cast three deep; in some places we cast them four deep.

Plate 7: This is another view of the columns. The hole in the end is for lifting column off of this bed. This is made by a piece of 1¼-inch pipe, which is removed after concrete has started to set.

Plate 8 shows a group of 91 roof slabs in the piles as they were cast.

Plate 9: This shows the crane lifting one of the columns free so as to get the column clamp attached. The column clamp is shown on the left.

Plate 10 shows one of the columns being loaded by the locomotive crane.

Plate 11 shows method of lifting roof slabs from their beds. After the slab is blocked up another "V" hook is attached at the other end and slab is handled in a horizontal position.

Plate 12 shows a bed of girders; these girders go on outside of building and have bolts for fastening the machinery. The crane is in the act of lifting one of them by means of the hole cast in one end.

Plate 13 shows the crane setting one of the columns in its socket. You can see at the top of the column the clamp for holding it in a vertical position. The girder is lying alongside, ready to be raised.

Plate 14: Here the crane is about to set the girder in place.

Plate 15 shows a few of the columns and girders in place on the outside of building. These columns carry heavy vibrating machinery, and for that reason cross-bracing is put in on every third panel.

We now come to the important part of all engineering structures—the cost. Accurate costs were kept of the cast members, which will be given later, but before going into these I want to give you some general data in regard to making the 1,048 pieces necessary for the building.

The work on these cast members was started September 25, 1907, and completed November 23, 1907; that is, it was all done in two months. Of course, some preliminary work had been done previously, such as setting up concrete mixer, laying railroad track and making a few casting floors to start on. The average number of men employed during this time was twenty-three. Eleven of these were classed as carpenters and foremen, whose average rate was 24 cents per hour; twelve were classed as laborers, whose average rate was 15 cents per hour.

The lumber used for making the 1,048 pieces was 7,000 board feet, which at $27 per thousand makes a total of $189.

The total amount of steel used was 201,400 pounds, the average price of which delivered at our mill was .0203, or a total cost of $4,088.

The mixture used was 1 to 6, using the run of crusher stone straight without sand. The stone would all pass a ⅝-inch screen.

In the following costs the stone is figured at 60 cents per cubic yard, while the cement is figured at $1 per barrel.

Cost of Each Column Complete on Casting Floor.

Cost of steel	$ 8.57
Cost of material for concrete	5.48
Carpenter labor	4.27
Labor, making and placing concrete and reinforcing	1.95
Total per column	$19.27

The cost per cubic yard concrete without steel is $3.64.

If these columns had been made of yellow pine at $35 per thousand, and of the same dimensions, the lumber alone would cost $33.60, as compared with $19.27 for complete concrete column.

Cost of Each Girder Complete on Casting Floor.

Steel	$ 5.53
Concrete material	3.51
Carpenter labor	2.26
Labor, mixing and placing, etc	1.34
Total per girder	$12.64

The cost per cubic yard concrete without steel is $4.20.

If it were made of yellow pine at $35 per thousand, and of the same dimensions, the cost of lumber alone would be $21.84, as compared with $12.64 for concrete girder complete.

Cost of Each Roof Slab Complete on Casting Floor.

Steel	$1.69
Concrete material	1.85
Carpenter labor	.423
Labor, mixing and placing concrete, whitewashing, smoothing tops, etc	.405
Total per slab	$4.37

There are 72 square feet in each slab; therefore the cost per square foot is .0607 cents, or $6.07 per 100 square feet.

Now let us compare this with corrugated iron as a roofing material. Our usual practice on roofs is to use No. 18 gauge corrugated iron:

Weight per square with usual lap is 292 pounds, at $3.05 per 100 pounds (for the iron alone)	$ 8.92
Paint for three coats	.61
Labor painting	.36
Labor putting on	2.75
Total per square in place	$12.64

I have not the actual figures for laying the concrete slabs, but we have a bid from a responsible party to erect the entire roof, columns and girders for $1,932. I believe we can do it cheaper by day labor, but let us assume this as the cost and allow the erection of the slabs to be one-half of it, as there are 518 squares in the building:

Cost of erection per square	$ 1.86
Cost of slabs per square	6.07
Total cost in place	$ 7.93

To sum up we have:

Cost of concrete roof slabs in place per square	$ 7.93
Cost of No. 18 gauge corrugated iron in place per square	12.64

That is, the cost of the corrugated iron is more than 50 per cent above the cost of the concrete roof slabs.

We tested one of the roof slabs to destruction. It failed at 7,700 pounds center load, with 12-foot span. This gives an ample factor of safety for a roof.

There have been criticisms of this class of construction:

1. The joint between the members is not sufficiently strong.

2. The expensive machinery necessary to hoist them in place.

In reply to the first I want to tell you of a case we had in setting up this building. Two of the girders were set on the columns 4 inches out of line. This was discovered after they had been in place three days, and we attempted to take them up. The crane, which has a lifting capacity of 16 tons, could not move them, and it was necessary to separate them by iron wedges driven in the joint. If all the joints are as sound as these after being set only three days I am satisfied that they will answer every purpose.

In reply to the second criticism: We of course used locomotive cranes and railroad for handling the pieces because we had these facilities on hand and it was more economical to do it in this manner. However, they are not at all necessary, as in many cases the floor of the building itself could be used for a casting floor and the members raised by an ordinary derrick or gin pole, for the heaviest piece weighed less than 6 tons, and it does not take a very large gin pole or derrick to lift 6 tons.

We have not as yet had an occasion to use slabs for the sides of a building, but see no reason why they could not be used as readily for siding as for roofing, if provision were made for bolting them to the columns.

One advantage is that the concrete and reinforcing can be properly inspected while it is being put in, as this can be readily done while working on the ground, but cannot be so readily done while working on high stagings. Each member can also be thoroughly inspected as it is removed from the casting floor, and in case any of the members are defective they can be discarded and others substituted.

Mr. Mason's subject is one almost entirely new and shows the trend of modern development, sug-

CONCRETE CONSTRUCTION WITH SEPARATELY MOLDED MEMBERS.

1. Concrete mixer in position.
2. General view of yard and casting floors.
3. Reinforcing for columns.
4. Method to prevent slabs, etc., from sticking.
5. Method of filling the slabs.
6. Girders and columns ready for loading.
7. Another view of the columns.
8. A group of roof slabs.
9. Crane lifting one of the columns free.
10. A column being loaded by locomotive crane.
11. Lifting roof slabs from their beds.
12. A bed of girders.
13. Crane setting one of the columns.
14. Crane setting girder in place.
15. Columns and girders in place.

gesting the many advantages of manufacturing columns, beams, girders, and, in fact, almost every structural member, upon a factory basis under rigid inspection, and all the possible control of materials and conditions of working, as against the difficulties and inconveniences that have to be overcome in the erection of the same work at the job, often in inclement weather and in high or low places where the same class of inspection becomes much more expensive, and often making high-grade work impossible. The effect of this paper will certainly be felt in the future practice of concrete engineering.

WEDNESDAY MORNING SESSION.

This session was set aside on the program to the section on concrete block and cement products. The report of the vice-president of this section, E. S. Larned of Boston, Mass., was a carefully prepared report printed in pamphlet form, which handled the subject of specifications for cement mortar blocks and concrete blocks from practical and scientific standpoints. It was arranged in such a way as to be of value for the consideration of municipal building authorities or boards of building inspection, so as to standardize material insofar as possible and make the same broadly applicable to their locality. His line of thought naturally develops a line of aggregates that enter largely into all cement equations. On this topic Mr. Larned gave a well adjusted talk that was full of valuable suggestions. The manufacturers of building blocks and cement products of every classification properly took up the discussion of the proposed specifications. It was plainly evident that it would be necessary to have a meeting of those members practically interested in developing the best business standard specifications for building blocks and other cement products. The discussion was consequently postponed to another period of the proceedings, and, in fact, this section held several meetings and the amended report was finally adopted at the last session of the convention with numerous alterations from the original report, which, however, in no way interfered with the general tenor and the main points of that document. The amended specifications as adopted by the association cannot at this time be printed, as the alterations and amendments have not yet been incorporated in the final report.

As vice-president of the section on machinery for cement users, M. Wetzstein, of the Ideal Concrete Machinery Company of South Bend, Ind., delivered the report in the paper which follows:

REPORT OF COMMITTEE ON MACHINERY FOR CEMENT USERS.

By M. Wetzstein, Chairman.

Mr. President and Members of the Association:

It is with sincere regret that in making my report on machinery for cement users I find it necessary to advise that not a single letter, paper, announcement or even suggestion has reached me from any member of the Machinery Manufacturers' Section, but mark you, even though they were represented on your Board and had an opportunity to register any dissatisfaction they may have felt, or hinted at any change in rules and regulations they may have desired, yet were they silent as the sphinx.

I recommend to you, as representing the Concrete Machinery for Cement Users' Section, the appointment of a permanent secretary for the national association, and who shall also bear the title of General Manager for Exhibitors; also that a salary be paid him of $2,500, $1,500 of which shall be paid by exhibitors, and in addition such reasonable expense account as is made necessary, with the understanding that he shall devote to the exhibitors such time and give attention to such duties as shall be prescribed and which shall have the sanction of the executive board. As a proof that my recommendation is feasible from the exhibitor's standpoint, I take as an illustration the present show.

There are approximately 130 exhibitors. Dividing these into $1,500 would make an expense to each individual exhibitor of, say, $12, and the proportion of each could be graduated as to space taken. I believe it would do away with many petty annoyances, grievances, loss of time, etc., and in the end would be of the greatest benefit and act as a saving instead of an additional expense. I believe it would mean an end to work in these great halls minus light and heat.

I further recommend a permanent place of exhibit. That this is a problem I appreciate. Here we have the largest hall in which we have yet exhibited and it is filled to overflowing.

It is with great regret that I must announce that the National Concrete Machinery Manufacturers' Association has ceased to exist, except possibly in name only, as its members failing to pay dues made it impossible to pay the expenses of calling the annual meeting, which should have been held last August.

As an officer and member of that association I have the most sincere personal regret that it no longer exists, and had you or any officer or member of the executive board of our national convention been in attendance at the last meeting at the Wayne Hotel, Detroit, Mich., during August of 1906, and noted the large attendance, the interest created in the splendid papers read, and the enthusiasm of each individual, it would not have seemed possible that the interest would so soon wane, and more particularly when it is taken into consideration that as a separate body we could have been of such great aid in helping you and associates in reference to at least one section of our splendid national organization. I know of no excuse or reason why that association should be down and out, and I make the promise that immediately after the close of this, the fourth annual convention of Cement Users, I will address a letter to every manufacturer of concrete machinery and try once more to unite in bonds of strength and unity that rapidly growing contingent who annually aid you with their time, money and labor to make the exhibit part of our annual convention a drawing card, the attraction par excellence, which more than all else is spreading the gospel of concrete and its uses to the layman, causing widespread interest, and I make the prediction that within two years no hall, auditorium or coliseum in this country at the present period will contain the area necessary to display the products of that rapidly growing giant—Concrete Machinery.

I point with pride to that old, deserted armory, which resounded for so many years with the words of command, the rhythm of measured step, and rattle of musketry in drilling evolutions. Today its spacious walls resound with the music and whir of machinery, vieing in efforts to pay tribute to His Majesty, "Concrete." Fitting is it, indeed, that here in the fourth year of his reign we crown him in an edifice erected in the long ago, of a now nearly obsolete building material, whereas no sooner will he bow his "adieu" than will he leave his imprint on Time's flight, since there will soon arise on that very spot an enduring pile, built of the twentieth century material; and prophetic is it, indeed, that some of the machinery now there exhibited may be used in the erection of an everlasting monument.

On every hand are evidences of greater perfection in concrete machinery. Each year sees added improvement in all the lines covered by that class of machines used in the Concrete Industry. Mixers, block machines, brick machines, tile machines, steam-curing machinery, ornamental molds, etc. As one year's convention spans to the next, time has been taken by the forelock, money expended, energy exerted, all in the betterment of that which was so interesting last year and is so bettered this year. New devices continue to spring into existence, and on every hand it seems that an Aladdin's lamp has cast its magic rays and lights to public gaze the genius of the inventive brain.

Awakening to the wonderful possibilities of the machinery and its products, it may well be said that opportunity is everywhere knocking at the public's gates, bidding them rise and partake of the delicious spread of honeyed prosperity which may be theirs.

Each buyer should, however, use his careful judgment in the selection of his needs. If desiring a mixer, he should acquaint himself first with the various varieties—continuous, batch, combination or proportioning—each has its functions and uses. He must judge by the work in hand and the business he is conducting, and choose accordingly. He assuredly has the opportunity of choice and has but himself to blame if he errs. Quality and perfection must also govern, and not the price.

In block machinery he will find his senses almost bewildered by the great array, but there he must be doubly cautious. He has more questions to ask himself than he could possibly ask of the seller. There are various types, sizes and styles; each has its advantages and good points. To choose he must know what kind of work is required, then the size, the workmanship, the range of possibilities, the perfection, the allowance for mortar joints, exact measurements of mold box, rapidity, simplicity of parts, labor required, length of period on the market, satisfaction to users, price consistent with quality, machined, fitted, strength, durability, hand and pneumatic tamping, future parts, attachments and accessories obtainable, whether manufactured from basic patterns, whether infringing, responsibility of the manufacturer, face plate designs obtainable, etc., etc.

In brick machines these same questions and thought should pertain.

In tile machines investigation not quite so comprehensive need only be pursued. Each year brings forth better devices.

Ornamental molds should be judged by strength, quality of iron, smoothness of inside finish, simplicity of locking device, elimination of lines of cleavage, beauty of design, advantage and rapid tamping, quick removal possibilities, simple unlocking devices, rapid re-use, symmetry, proportion, sharp outlines, etc.

Apparatus for steam curing is rapidly developing and the process is a very important and interesting subject. Large cylinders are being used, cars holding any quantity of blocks up to 200 each are being built, and recent tests, I am informed, have shown actual results in steam cured blocks of a crushing strength in two days equal to that of a perfectly cured and sprinkled block at the end of 180 days and with the use of but 50 per cent of the cement used for ordinarily cured blocks.

In pneumatic tamping machinery there has been rapid movement to perfection and numerous devices are exhibited, backed by responsible guarantee.

There is one development along the order of block machines that should receive our earnest condemnation, viz., the cheap "mail order" variety, consisting as they do, of a lot of castings thrown together and bolted. They are often sold because of those alluring bargain prices. The designs furnished are misnomers, the molds out of true, and in consequence we find produced a product with their use that is a monstrosity to the sight and a reflection of boomerang variety to the industry in general. Not only this, but these machines fall into the hands of those who know nothing whatever about concrete, and a product is therefore brought forth that may be of serious future import.

We need enlightenment on a subject that has set our block machinery manufacturers thinking and pondering. "Why," I ask, are our block machines so studiously avoided of all mention, and more so still their product, "concrete blocks," by the great cement concerns of this country? No recognition is accorded; none do them honor. Never is any mention made in all their trade literature, but ever is it avoided. One of these great cement companies publishing books on concrete and its use on the farm have never allowed the words "concrete blocks" to find lodgment in the print of their pages. With them it is ever an almost fanatical worship of "monolith." What have we done; what have the users of machines done to deserve this silent contempt? Is this the reward accorded to those whose machinery and its use have aided their stockholders in deriving added income? Are they aware that the concrete block industry is making gigantic strides; that ten thousand machines are digesting the product of their mills, and that each day there are added converts to the mighty host? One man alone among ye mighty has designed to smile upon us and we love him. There is an old saying, "A word to the wise is sufficient." Again and again do the users and prospective buyers of machinery ask, "How is this brand of cement, or that?" Suppose we were to demand our "Eye for an eye and tooth for a tooth." But we are silent to the wrongs done us and we charitably do unto them what we would like them to do unto us.

Each year, Mr. President, you invite concrete machinery manufacturers to make an exhibit. They pay liberally for space, light, decorations, etc. Their expense in coming from all sections of the country, often bringing numerous helpers, the shipment of their machinery, cartage, handling, preparation, the removal, and the many incidental expenses in connection, hotel service, etc., etc., are quite greater than most of you gentlemen realize. I grant you there is some compensation in the advertising derived, some for actual sales, but never in degree or volume commensurate with the expense. We must acknowledge the exhibit is your greatest source of revenue, and I feel that if you will act on a suggestion I wish to make, your revenue will greatly increase. The inducement I ask you to extend them is that your board arrange for greater publicity by press notices, billboards and advertisement, giving the utmost publicity to these annual conventions and meetings. Where now a friendly rivalry exists in the making of display, a campaign of greater publicity to you, begun immediately after the selection of the city, would arouse enthusiasm, stimulate rivalry to greater efforts, and the incentive would act like magic. Displays would be made artistic, elaborate and interesting. The press would enthuse, the public patronize in myriads, with the result that door receipts would swell to grand proportions, the treasury begin to bulge, and the advertising investment be returned to your coffers manyfold, and a fund created to place our association on a basis of unexampled prosperity and affluence. In these times of so-called panic I know you will relish my vein of optimistic thought. A pessimist will not mix well without cement enthusiasts.

REPORT OF COMMITTEE ON ART AND ARCHITECTURE.

By Charles D. Watson, Pittsburg.

I am sure that we are very fortunate to have with us Mr. R. W. Leslie, who in his excellent paper has illustrated such beautiful work accomplished with concrete. It is gratifying to note the attention that architects are beginning to give to the artistic treatment of this material. So much has been written and the subject so thoroughly exhausted that your chairman refrained from attempting his usual paper on the subject before this convention and requested the president to allot the time required for such report to some architect whose training qualifies him to properly cope with the subject.

In the minds of those who have read the proceedings of the recent convention of the American Institute of Architects there cannot remain the slightest doubt that the profession realizes that in concrete they have a new means of expression. The possibilities of this treatment are so extensive that it would not be surprising if it developed even a new style of architecture.

As ever your committee on art and architecture is confronted with the still unsolved problem of what can this association do to further the artistic development of concrete construction. We have comparatively few members who are architects, the majority of us being practical cement users and only indirectly interested in art. Yet we must not lose sight of the fact that the whole success of the use of concrete for building construction, except for structural purposes, depends upon the architect's ability to get artistic results in its employment.

There is but one line of work which it is possible for your committee to pursue, and that is an annual review of the progress made in this important branch of the development of concrete. In former reports your chairman has attempted such a report by the collecting of photographs or designs for the purpose of illustration by stereopticon at the annual convention. He has not only found it difficult to get architects and even members of the association to respond to his request for such designs, but has found that the selection of that work which has particular artistic merit is impossible without the assistance of competent judges on art.

Your chairman has endeavored to devise some means to interest architects sufficiently in the work that we are doing, so that they will respond to the request to send us samples of their work. This association cannot afford, like the National Association of Cement Manufacturers, to give prizes for designs, but it would seem that if arrangements could be made to illustrate in our annual proceedings a few of the best designs with honorable mention of the architects who conceived them, the profession would consider it of sufficient honor to warrant the work and trouble of sending in illustrations of such work. To accomplish this, it is necessary that some arrangement be made to obtain competent judges to pass on the designs submitted to decide which shall be published.

In view of the above, your chairman wishes to make the following recommendations as his report on the division of art and architecture:

1. That this association, through the courtesy of the technical press, advise all architects that we desire photographs of designs of works in concrete which have particular artistic merit.
2. That at our annual convention fifty of the best designs submitted shall be illustrated by the use of the stereopticon before the convention, honorable mention being given to the designer.
3. That the best ten of these fifty designs shall be published as illustrations of this association's annual proceedings.
4. That to every architect whose designs are included in the best ten shall be given gratis twenty copies of our annual proceedings.
5. That the remaining forty designs shall be illustrated in the annual report, and the architects of each shall be given gratis ten copies of such proceedings.
6. That arrangements be made with the American Institute of Architects to appoint a committee who shall select the above-mentioned designs.
7. That, in conjunction with this committee, the conditions under which designs are to be submitted shall be outlined, dividing them into such classes as this architectural committee shall designate.

This was also one of the most entertaining features of the convention, and as usual Mr. Watson's talk was enthusiastically received. There is no more important branch of association work than that interesting the architect in the possibilities of concrete for ornamental and classic designing. The treatment of finished cement work is still not receiving the amount of attention which it deserves, and the speaker made a strong appeal for more careful attention in this direction.

Robert W. Lesley, who has been called the dean of the cement industry in America, began, amidst the applause of anticipation, to read his paper entitled:

CO-OPERATION: WHAT IT IS AND WHAT IT CAN ACCOMPLISH.

By Robert W. Lesley.

The present seems the age of coöperation, and more especially in cement and its affiliated industries and interests. That coöperation has done much for this important material in which we have all common claims is too well known to need repetition, but briefly, let us consider the subject as it exists to-day and see what coöperation has done for us in the field of engineering. It is but a few years ago that the Portland cement industry began to take the giant strides which have made it one of the great manufacturing interests of the country, and it is but a few years ago that concrete block, and in fact concrete construction of every description, became most important in the country. Let us look back at the causes which have led to this development. Certain it is that while the result may be partially due to the diminution of the supply of timber and the high cost of steel, yet without the confidence and security which the coöperation of engineering societies in their specifications and in their reports upon cement have given, the great progress we are all now enjoying would not have existed.

First: We have the question of specifications for cement. These specifications, which are familiar to you all, are the result of the work of committees of the leading engineering societies, in conjunction with the joint committee on cement of the American Society for Testing Materials. The work of this committee during the past five years has produced the Standard Specification, of which probably fifty thousand copies have been sent to all parts of the United States, and in point of fact to all parts of the world, and have made stable, permanent and fixed the qualities which engineers, manufacturers and consumers expect to find in Portland cement. Prior to this coöperation of engineers, specifications were vague and uncertain. In the mind of each man was his own specification. Trouble to the consumer, user, manufacturer and engineer of not knowing what good Portland cement should give under test was the never ending question, but to-day, owing to the coöperation of the engineering societies, and the manufacturers themselves, the cloud has been rolled away, and a standard product is the result, the qualities of which are familiar to you all.

Second: The next field with which we are all familiar in the line of coöperation is that of concrete and reinforced concrete. The committee on this subject, which is composed of representatives of the various engineering societies, and on which your association is also represented, has, for over four years, been laboring arduously for the production of a specification fixing the qualities of what is known as concrete and reinforced concrete. In conjunction with the National Advisory Board on Fuels and Structural Materials, the committee has been afforded the support of the government to the extent of more than a hundred thousand dollars, which have been expended under the direction of our president, Mr. Humphrey, and the National Laboratory at St. Louis. The work of this committee has been criticised, possibly because it has not been immediately fruitful, but the subject which has been entrusted to the body requires time, consideration and deliberation. It is with pleasure that, as a member of the National Advisory Board on Fuels and Structural Materials and the Joint Committee on Concrete and Reinforced Concrete, I feel able to announce that the end of our labor is approaching and that out of the four years of labor and thought, a standard specification for concrete and reinforced concrete will be brought forth. Already several temporary bulletins have been printed, and there are in press, or ready for the press, about twenty more bulletins, containing in all some twelve hundred pages of tests and experiments, which will be made public as rapidly as possible, and which will be the basic elements upon which the standard specification will be made.

Now, take these two instances of coöperation from the engineering standpoint, and let us see what they have done for us. First, the question of what Portland cement is and what test it should stand under proper specifications is settled. The manufacturing and testing requirements have been covered and for every one who deals with cement the question of specifications is a closed one, for the time being at least, according to our present knowledge.

Now to the subject of concrete and reinforced concrete. You all know the obstacles that concrete has met with on all sides from those interested in other materials, and also from those desiring to induce extraordinary fire rates to be placed upon this important material of construction. You all know how these desires have manifested themselves in the suggested specifications for concrete in many cities, or by the restrictions of fire insurance authorities. As a matter of fact, it may be stated almost as an accomplished prediction that when the standard code for concrete and reinforced concrete is made public, that there will be an absolute, clear-cut and definite specification for work in concrete and reinforced concrete as there is now for Portland cement itself, and with the progressive spirit that animates our American municipalities, it is but proper to assume that once this specification is made, building departments all over the country will be prompt to adopt it. So, too, the fire risk experiments that have been made at the St. Louis and Chicago laboratories and the fire record data that have been gathered by the joint committee, will, when compiled and put in form, make such a demonstration of concrete, as a fire-resisting material, that the insurance men will be only too glad to unqualifiedly recognize it as such. So much for what coöperation has done.

Now let us see what coöperation can do. We read that the cement manufacturers have organized an Association of Licensed Cement Manufacturers in which many of the great producers have joined. We also note that the Association of American Portland Cement Manufacturers is another important body having to do with the development and best interests of this great industry. Both of these bodies working hand in hand hope to produce important developments in the broadest way in their chosen field.

It is expected that within a short period this coöperation among cement manufacturers may lead to the establishment of such a laboratory as is now possessed by the German Portland Cement Manufacturers' Association—a laboratory unequaled in its equipment for testing and investigation work, and this laboratory will no doubt, under proper arrangement, be placed by reason of the broad spirit of coöperation, at the service of the cement users and other kindred associations for such investigations as they might desire to make, they being users of the material produced by the manufacturers controlling the laboratory. Such a laboratory might very properly—following out the same field of coöperation, test and certify, under scientific engineering inspection, as the quality of American brands of cement being sold in the markets of the world as representative of exported cements. It might also certify to the strength, under similar methods and with eminent scientific authority, of block, bricks, pipes and other products made by members of the Cement Users' Association. Thus, by this coöperation between the cement manufacturers and cement users, a vast field of experimental work and scientific research would be opened up in the field of cement and concrete development.

Now as to coöperation among cement users. This association is the National Association of Cement Users. If national, why not national in its broadest lines? I recognize that local organizations of cement users in Iowa, Nebraska, Kansas, etc., may be with propriety called local organizations. Why should not our association embrace all these local organizations and have their local fields, either by consolidation or by giving all local state organizations representation in the main body according to membership? That information which the cement users of Iowa desire is the identical information which the cement users of Massachusetts want; they are all dealing in the same product and desire to achieve the same results. The Cement Users' Association should have the coöperation of every cement user. It should know no East, no West, no North, or no South, but it should be national, and should be the fountain head of all information on this important subject. It should not be necessary that the papers of interest that are published in the various western papers and the proceedings of the western associations should be scattered in loose pamphlets or in loose volumes, but all these papers should, as the representative expression of sections of a national association, be part of our proceedings.

Now, how is this to be accomplished? Our annual book is gotten out with great difficulty and at great expense. Our income is not large enough to meet our requirements. We have not funds enough to provide a proper secretary at a salary sufficient to make a business of our business. We should start by having such a secretary, and taking in as sections of our associations, the proper representation of the local concrete and cement users all over the United States. These bodies, at moderate dues per member, or at a reasonable rate of dues as an association, should be given representation in our body, and their proceedings should be published as proceedings of a section of our association, so that a member of any of these bodies would get a copy of the proceedings of the National Association of Cement Users. The cement manufacturers and also the block and machinery makers should also be interested in the development of such an association as this. There should be a class of contributing members at $25 or $50 per annum, to which class cement machinery manufacturers, as above stated, should be alone eligible. These are interests which are primarily interested in the success of cement users, and to them should be committed the duty of providing the large amount of money required to conduct such a national association on the coöperative lines as I have described, and to enable it to circulate such bulletins and to produce such volumes of annual proceedings as will be a credit to our organization.

Now, to another point of coöperation, and in this I speak with a little delicacy, but feel that in handling the subject of coöperation it is but fair to bring before you all the facts. Is the National Association of Cement Users properly warranted in becoming a National Association of Cement Exhibitors, or is not the field of annual exhibition rather within the purlieu of the producer of the cement itself and of the machinery for making blocks, pipes and other forms of cement products? In other words, is not our association only concerned in the uses of cement, and are we not more interested in information that will make our products better; make our results more uniform, and make our costs less, rather than in an exhibition showing the machinery with which we make our products and the cement of which our products are made? My feeling is that two cement exhibitions in a year is too great a task upon those of us who are really interested in this association, and as one exhibition a year will, as a natural result, become one week that each of us is ready to devote to this subject, there ought to be coöperation between the Chicago Exposition Company and our association in this matter of expositions, and that possibly an arrangement by which for two years the exposition would be held under the auspices of the Chicago association in the West, and the third year under the auspices of a similar exposition society at the sea coast in the East, would accomplish a result beneficial to all. Coöperation between the society and exhibition is a primary requirement. This would take a large amount of responsibility off the officers of our association and put it where it properly belongs, upon those interested in the products of our exhibitors. Such an arrangement would improve our meetings and lessen our expenses, and our association would gather its proper award by having these expositions always held under the auspices of the National Association of Cement Users.

Now to conclude. One more field of coöperation and one most difficult to reach seems to have been met in the convention of the National Institute of Architects at Chicago, where the profession, in the person of its most distinguished representatives—some of whom will address our convention—joined hands with the cement users and cement manufacturers in listening to papers covering the artistic and architectural possibilities of the material in which we are all interested, and it is in this field of coöperation, namely, the combination of art and architecture in concrete, that I desire to occupy your attention for a few moments while I run through about a dozen slides showing the latest development of concrete.

A GROUP OF OFFICERS AND PROMINENT CONVENTION WORKERS.

At the close of the address Mr. Lesley showed a number of stereopticon views of the artistic treatment of cement surfaces by the use of colored tile.

Vice-President M. S. Daniels read the detailed report of the executive committee during the past year. He began with the report of the treasury, the secretary's resignation and the minutes of the various meetings of the executive committee. The following changes in the by-laws of the association were recommended:

In accordance with the provisions of the by-laws the following amendments, approved by the executive board at its meeting on September 9, 1907, will come before the convention for consideration:

Amend Article II by inserting after Section 1 the following:

"Section 2. There shall be an executive committee of the executive board, consisting of the president, secretary, treasurer and two of its members, who shall be appointed by the executive board."

Insert after Section 7:

"Section 9. The executive committee shall manage the affairs of the association during the interim between the meetings of the executive board."

Amend Section 8 to read:

"Section 10. The association shall be divided into such sections as the executive board may determine by the enrollment of members of the association in such sections as they may choose. The chairmen of these sections shall be reported by the committee on nomination of officers to the association for election as vice presidents of the association at the general election. Standing committees of four additional members each shall be appointed by the president of the association in consultation with the respective chairmen to aid them in their work."

Amend Section 9 so as to read:

"Section 11. At the first regular session of the annual convention the president shall announce the committee on nomination of officers and the committee on resolutions. These committees shall be appointed by the executive board."

Renumber Sections 2, 3, 4, 5, 6, 7 and 10.
Amend Article III by adding:
"Section 2. The executive board shall meet at least twice each year, the time and place to be fixed by the executive committee."
Amend Article IV by striking out Section 4.
The above amendments will come up for consideration at the business session on Wednesday morning, January 22, 1908.
In accordance with the provisions of the by-laws the executive board has divided the association into the following sections for the year 1908:
1. Testing Cement and Cement Products.
2. Art and Architecture.
3. Cement Products.
4. Insurance Laws and Ordinances.
5. Reinforced Concrete.

On motion, the report was received and ordered filed, and the changes in the by-laws, being pretty generally well understood, were adopted as read.

George H. Levard, of Atlantic City, N. J., extended an invitation from the Publicity Committee of that city for the association to hold its next annual convention there.

Robert C. Morris, of Louisville, Ky., on behalf of the Commercial Club of that city, invited the association to consider the Southern metropolis.

Curt M. Treat, of Chicago, from the Assembly of Commerce, told of the success of all conventions held in that city and asked the committee to consider Chicago. He promised all kinds of coöperation.

The president explained that the power to decide the place of next meeting was placed by the constitution in the hands of the executive committee, who would investigate the most available and desirable place for holding the convention.

Mr. Lesley moved, for the purpose of providing a class of contributing members immediately, that the president appoint a committee to take all necessary action before the convention adjourned.

This was seconded by E. D. Boyer, and John Conzelman, Robert C. Morris, Mentor Wetzstein, E. S. Larned and others spoke upon the question—all in favor of providing in this only feasible way enough funds to carry on and enlarge the educational usefulness of the association.

President Humphrey said that now this important matter was up for consideration he wanted to see the motion put through in such a way as to produce the desired results, without putting it up to the officers to shop around and beg for money for every trivial expense of the association. He cited the constitution on the subject, saying that this cannot now be an amendment to the by-laws, but will have to go over till next year in that shape. It must be a voluntary plan devised for immediate results.

There was a little more parley, and finally the motion was put and unanimously carried.

The president appointed on this committee Robert W. Lesley, E. D. Boyer, John Conzelman, Robert C. Morris and Mentor Wetzstein. He stated that he would make additions to these later.

E. D. Boyer, chairman of the committee on nominations, reported as follows:

President—Richard L. Humphrey.
First vice-president—Merrill Watson.
Second vice-president—M. S. Daniels.
Third vice-president—S. B. Newberry.
Fourth vice-president—George C. Walters.
Treasurer—H. C. Turner, 11 Broadway, N. Y.
Secretary—George C. Wright, 35 Grand avenue, Rochester, N. Y.

Section Vice-Presidents.

Cement Products and Machinery—O. U. Miracle.
Streets, Sidewalks and Floors—W. S. Shuler.
Art and Architecture—C. D. Watson.
Reinforced Concrete—S. E. Thompson.
Testing of Cement and Cement Products—E. S. Larned.
Laws, Ordinances and Insurance—W. H. Hamm.

These nominations were received with enthusiastic applause.

O. U. Miracle asked to withdraw in favor of A. T. Bradley, of Rochester, N. Y., and, agreeable to this request, Mr. Bradley's name was substituted.

There was a motion to instruct the secretary to cast one ballot, which was accordingly done amidst enthusiastic cheering.

WEDNESDAY EVENING, JANUARY 22.

President Humphrey called the evening session to order promptly on the hour. First in order was a paper by Architect E. B. Green of Buffalo.

TREATMENT OF CONCRETE SURFACES.

By E. B. Green, Buffalo, N. Y.

I need not to tell you that the architect's interest in the uses of cement is second only to your own. But while you are enabled to give your entire time and thought to cement construction, his interests are necessarily divided among many methods of construction and various materials.

When you think of the various things that enter into the construction of a modern building, of which he must have more than a passing knowledge, and to no one of which must he give an undue weight, it will appeal to you that the interest which he takes in concrete construction must be somewhat less than yours.

He cannot pretend to become an expert in any one method of construction, and it therefore gives us pleasure and much profit to become acquainted and be surrounded with those who devote their efforts and intellectual forces to one or two channels in the art of building.

Architects, as a class, are conservative, and our energies and thoughts are given to the designing, to the *form* of the *structure*. The carrying out of the work is best left to those equipped for that special purpose. We, of course, must be conversant with the various methods of fabricating the material in order to design the structure properly.

As yet, our profession rests primarily upon that of *form, scale* and the *disposition* of *mass* and *voids* (which is the design) more than on the methods or materials of construction.

I may say that all architects are looking forward to the study of this question with the keenest interest. We have become familiar with the structural side, and are constantly urged to take up the esthetic side of the use of concrete. It holds forth tremendous possibilities, and the day will be a happy one when you have devised methods for the use of cement which will make it possible to do away with wood construction in all city buildings. Can we realize what it would mean to have all our buildings in this city fireproof—the lessening of taxation, to say nothing of the danger from fire?

To tell you the interest which the architects are taking in the subject of concrete and reinforced concrete, I will say that nearly two days out of the four allotted to the annual meeting of the American Institute of Architects were devoted to the discussion of concrete, and we had some pretty stirring times and a good deal of ripping up the back of old methods, and it did us all a lot of good. Still the concensus of opinion at the end seemed to be one of uncertainty and caution—we must be careful. The methods are not yet on the same basis as masonry construction and the manufacture of steel, for instance. It is difficult, if not impossible, to make a test of the work before it is completed, but if it were possible to fabricate concrete under known conditions and under cover, I think the architects would be still more enthusiastic and ready to take the question up on its esthetic side.

The question of weather, the proper mixing of the material and of the forms and the reinforcement, mean so much that under the very best conditions the contractor has a difficult problem to get his labor to do as he directs.

A report was read at this convention by the chairman of the Committee on Applied Arts and Sciences, Mr. Irving K. Pond of Chicago; Messrs. Claude Bragdon, Elmer Grey, Charles Z. Klander and Bertram G. Goodhue being on the committee. This report defines so well the position of the architect in regard to the use of concrete that I have chosen to read it as giving you an authorized idea of the architect's standpoint.

"Although the exact relationship existing between concrete and steel reinforcement under a given condition is yet to be accurately determined, and the structural use of reinforced concrete is yet to be reduced to an exact science, and although the manipulation of concrete and its application to structural uses has not as yet become an art, yet the fact that in its use and treatment there are immense scientific and esthetic possibilities brings the subject of reinforced concrete well within the field of study of this committee, especially at this time, when the general topics of steel structure and concrete reinforcement are before the institute for discussion. It is essential throughout such discussion to keep clearly in mind the true and abiding status of architecture and the architect. The architect is not a mechanical fabricator of mathematical diagrams. His highest concern is with the ideal, and his first sketch should present an idea, an idea which is conceived in beauty. The past has demonstrated

Continued on page 52A.

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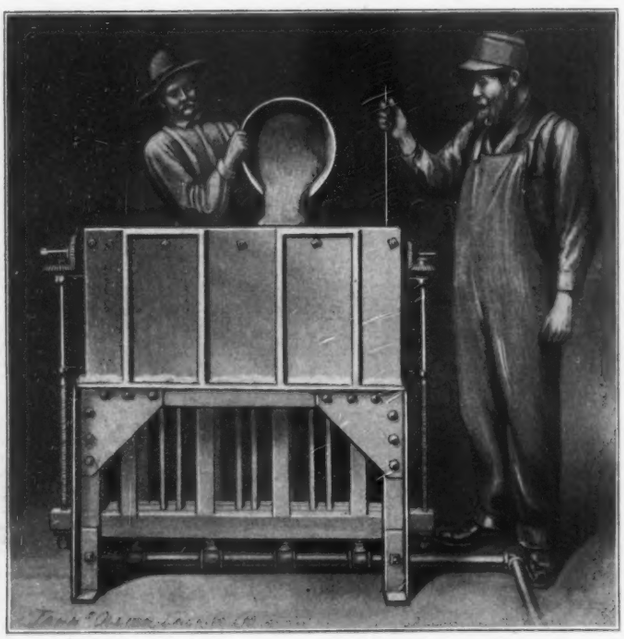

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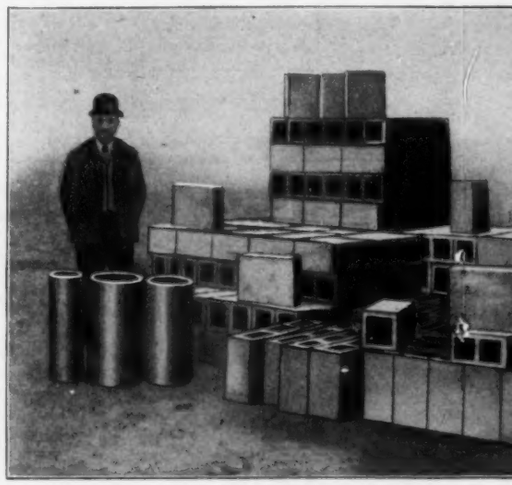

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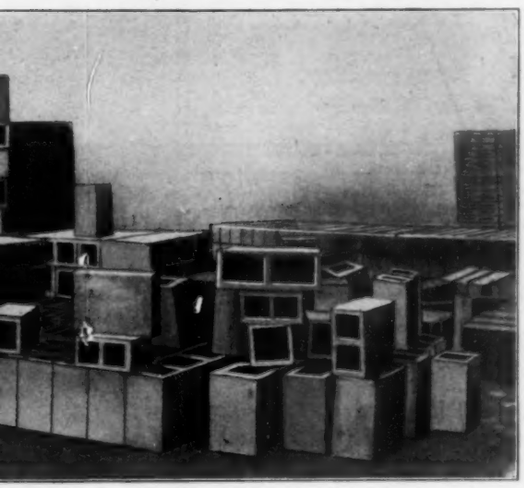

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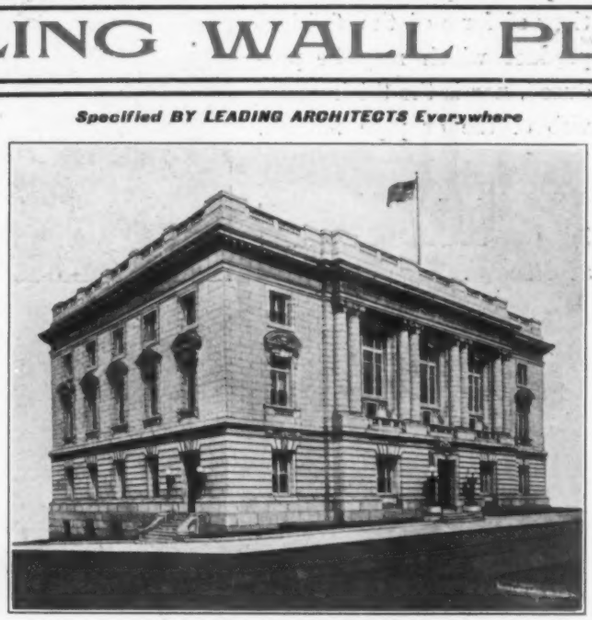

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WRITE FOR BOOKLET

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CONCRETE ENGINEERING

Indiana Engineering Society.

INDIANAPOLIS, Jan. 22.—The Indiana Engineering Society held its annual convention in the Commercial Club room January 16, 17 and 18. Two sessions were held each day, including one night session. About fifty members attended. The report of the secretary showed that nine new members had been added to the roll during the year and that the society was in a flourishing condition. President W. K. Hatt said in his annual address that he found it a pleasant duty to welcome the members to the twenty-eighth annual meeting and congratulated the society on the progress made during the year. He said he could not let the opportunity pass without emphasizing the fact that as the years go by the progress of the age and the development of engineering demands greater skill and learning in order to successfully accomplish the greater things and handle the still greater questions devolving upon the craft, both as to engineering skill and the testing and selecting of materials.

The papers read and the discussions thereon, together with the illustrated lectures, gave unusual and popular homage to concrete and cement products, as well as material for macadam roads. The first paper on the program was read by G. C. Houston, of Watseka, Ill., on "The Cost of Gravel and Macadam Roads." Mr. Houston formerly lived in Indiana and was engaged in road construction. He said the gravel pikes, which are a source of pride throughout Indiana, must give place to the crushed stone road, and even this must be treated with asphalt or coal tar in its upper courses in order to compete with the roads in the East and withstand the action of the automobile wheels. He declared the pneumatic tire was the cause of the trouble. Its yielding surface, combined with the great weight of the machines and the high speed at which they are operated, creates a subtle but powerful suction, which loosens the gravel and smaller stones and prevents their "binding," which is necessary for a perfect roadway. To overcome this difficulty the asphalt or hot coal tar treatment may be successfully used.

The report of the committee on materials of construction was made by E. L. Hancock, chairman, of Purdue University. Mr. Hancock illustrated his paper with slides, showing the uses and tests of the various materials and their relative strength and durability; also endurance in case of fire.

In a paper on "Track Construction in Streets for Interurban Service," by Thomas B. McMath of Indianapolis, Mr. McMath said that concrete foundation was found indispensable for the ties in constructing city lines for use by the interurban cars.

"Concrete Structures from the Viewpoint of the Contracting Specialist" was the subject of an interesting paper read by D. V. Moore of Indianapolis. This paper was well received as having treated in an exhaustive manner of all the details of a contract to construct a large concrete structure.

Other papers were read and illustrated lectures given as follows: "Building Laws to Regulate Reinforced Concrete Construction," by H. C. Brubaker, Indianapolis; "Test of a Pozzolan Cement Called Portland Cement," by Prof. Schofield of Purdue University; "Result of Use of White Portland Cement," by M.M. Smith, Kimmell; "The Work of the Structural Materials Laboratories of the U. S. Geological Survey," by R. L. Humphrey, in charge at St. Louis, Mo., and the "Test of a Reinforced Concrete Floor," by Prof. W. K. Hatt, Purdue University.

The election of officers resulted in the selection of Prof. W. K. Hatt of Purdue for president; C. C. Brown, Indianapolis, vice-president, and Charles Brossmann, Indianapolis, secretary-treasurer. The meeting closed with a banquet at the Grand Hotel.

THE TEST OF FIRE.

Conclusive Proof that Properly Made Concrete Blocks May be Depended Upon.

ANDERSON, IND., Dec. 23.—The photographs presented herewith, which were taken by W. R. Forkner of this city, show, respectively, the interior and exterior of the Old People's Home Building after the disastrous conflagration of December 9. The building in question was erected by the Gospel Trumpet Company. The fierceness of the conflagration may be realized from a study of these photographs. It will be observed that there is not a sign of a window-frame or door-frame in any of the walls. Yet today the walls themselves are in perfect condition and will require no repairs for rebuilding. The pictures were taken as soon as possible after the fire had cooled, nothing whatever having been removed from the walls. It will be noted that everything except the walls and the steel girders was entirely consumed.

The Gospel Trumpet Company purchased in 1906 from the Century Cement Machine Company (Rochester, N. Y.) some of their Hercules machines, and with them erected a number of very handsome buildings. The building destroyed was the last one completed. It was a three-story and basement structure and contained forty rooms besides dining-room, bath-rooms, offices, etc. The building was to have been occupied about the first of January. The fire was evidently of incendiary origin, but owing to the fact that the building was new, proper arrangements had not been completed for fire protection. It was for this reason undoubtedly that the entire interior of the building was gutted.

The fact that the walls did not collapse has caused much talk in this vicinity. Since the photographs were taken the walls have been examined and found perfect in every respect, and the work of remodeling will now be begun, using, of course, the original walls.

The Century Cement Machine Company write to ROCK PRODUCTS with reference to the photographs of the Old People's Home at Anderson, Ind., that they followed the Gospel Trumpet Company very closely in their operations and paid particular attention to the manner in which their blocks were made, insisting on their using the best of materials and plenty of water. Undoubtedly this had very much to do with the fact that the walls set so perfectly. The Century Cement Company have every reason to be proud of the splendid manner in which the product of their machines has stood the fire test.

Under date of January 22 Mr. John B. Martin, business manager of the Gospel Trumpet Company, writes to the editors of ROCK PRODUCTS in answer to an inquiry as follows: "In reply to yours of the 16th inst. with reference to the building which was burned on the 9th of December, we have to say: The basement walls are 16 inches, the first story 12 inches, and the second and third, 10 inches. The blocks were laid in cement and sand mortar, one to two parts. The blocks were made by the Gospel Trumpet Company, the facing being one to two parts sand and cement, and the body of the block one to four. Lehigh Valley and Alma Portland cement was used. Sand and gravel was used in making blocks. There was no crushed stone used. The building is now ready for the roof."

The Famous Boardwalk to be Reconstructed.

A recent illustration of the growing confidence in the permanency of concrete construction is evidenced by a decision of the streets, walks and drives committee of the City Council of Atlantic City, N. J., to reconstruct a large portion of the famous boardwalk, using concrete piles connected by concrete girders. This contract has been awarded to the Raymond Concrete Pile Company of New York and Chicago. The portion of the walk which is to be reconstructed extends from Connecticut to Pacific Avenues, and is located between 300 and 500 feet nearer the ocean than the site of the present walk.

The contract as awarded calls for 800 feet of a walk 41 feet wide and 2,400 feet of walk 21 feet wide. The walk is supported on 380 concrete piles, 16 inches in diameter, varying from 28 feet to 32 feet in length. These piles are arranged in bents of four and two; 20 feet from center to center of bent. The tops of the piles are connected by a reinforced concrete girder 24 inches in depth and 8½ inches wide. These girders form a support for the 14"x4" joists.

The upper surface of the walk is faced with 2-inch plank, thus retaining to a certain extent the appearance of the former boardwalk.

VIEWS OF EXTERIOR AND INTERIOR OF OLD PEOPLE'S HOME, ANDERSON, IND., AFTER CONFLAGRATION.
(From photographs by W. R. Forkner, taken as soon as the structure had cooled.)

Harmony Among Cement Users.

The reëlection of Richard L. Humphrey as president of the National Cement Users' Association comes as an indorsement of his policies and a tribute of appreciation of his labors in the past three years of the association's history. The reëlection of such a large number of the other officers at the same time indicates the perfect harmony that prevails among the membership of the association. It augurs well for the future when several hundred men from all parts of the United States come together and agree like one man that they already have the best possible selection of leaders. Such harmony itself almost amounts to coöperation of the quality which makes results. Mr. Humphrey, on his part, sees another year of care and responsibility before him, and he is the man to see all the elements that have made the success of the association in the past. He will not spare himself, and if all the officers and members will help, each in his sphere, as much as he can, there will be a marvelous amount of work accomplished.

Handsome Concrete Porch and Terrace.

IRONTON, O., Jan. 15.—The photograph herewith shows the front of the residence of the Hon. S. B. Steece, president and general manager of the Ironton Portland Cement Company. The picture is particularly noteworthy on account of the handsome porch and terrace designed by T. S. Murray & Son and erected under their supervision last fall. The construction is entirely of cement, including the foundation walls, floor, pedestals, fluted columns with Ionic capitals, rails and balusters. The beams, cornice and balcony floor are reinforced. The porch ceiling is neatly paneled. The work was done by M. A. Mulligan in a first-class and creditable manner, and it constitutes a splendid example of what can be done in this line when competent hands carry out a good design. Mr. Steece proposes to add

RESIDENCE OF S. B. STEECE, IRONTON, O.

further improvements to his residence in the course of the year by having a stucco cornice erected, with dormers in the roof, etc. He is a thorough believer in cement and its future and is pushing the product of his plant in all markets.

The porch herewith illustrated is 12 by 50 feet, and the terrace 10 by 50 feet. Mr. Murray states that the cost was about $2,000. The pictures give only a faint idea of the beauty of this work, but the splendid proportions of the structure may be realized by comparing the size of the columns, for instance, with the figures, which are those of Mr. and Mrs. Steece and their daughter-in-law.

Cement Sidewalks in Detroit.

DETROIT, Jan. 15.—Detroit will pay less this year for cement sidewalks and intersections than was paid last year. The Detroit Artificial Stone Sidewalk Company bid 10 cents per square foot for sidewalks to be laid on the East Side. Last year's price was 11 cents per square foot. Archer & Lanyon bid 10½ cents for walks on the West Side. East Side intersections last year cost the city 12 cents, and this year the Detroit Artificial Stone Sidewalk Company bid only 11 cents. Archer & Lanyon bid 11½ cents on West Side intersections.

H. F. Sanville, structural engineer, has joined the organization of Frank B. Gilbreth, the well-known general contractor. He has had no little successful experience along engineering and electrical lines.

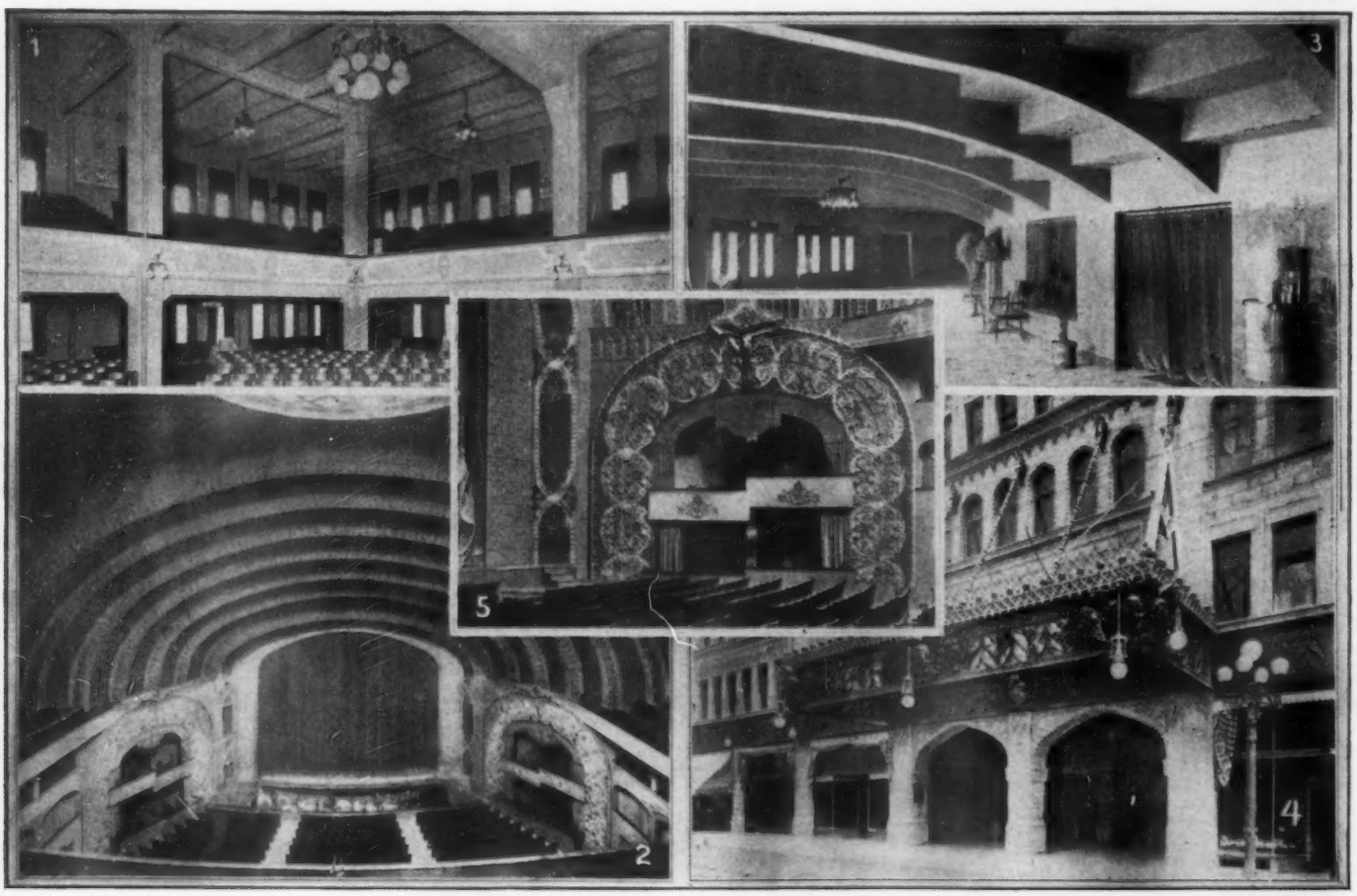
THE LOS ANGELES AUDITORIUM.

Continued from page 10.

must be regarded as very remarkable, and will go far toward encouraging this form of roof construction. Under an applied load of 100 pounds to the square foot the deflection amounted to a mere trifle, only one-eighth of an inch. Making a span of 42 feet, the girders, which are 63 inches in depth, carry an enormous concentrated load, amounting to 100 pounds to the square foot. The center consists of a concrete column which runs through five stories and an attic.

Another noteworthy and distinctly encouraging feature of the great auditorium proper is the remarkable acoustic properties that it possesses. It is said to excel in this regard all the large operahouses in the world, a circumstances that is accounted for from the fact that the entire building is of concrete construction. From the farthest seat in the upper balcony, which is located 130 feet from the curtain fly, it is possible to hear the prompter on the stage.

This structure is the realization of the plans of C. R. Harris, the Auditorium Company's vice-president and general manager, who, in past years, was a civil engineer. The architect is C. E. Whittlesey. The general contractor is W. Crowell. The Empire Stone Company furnished the granite facing. The main foyer is wainscoted with Tennessee marble.



INTERIOR VIEWS IN THE LOS ANGELES AUDITORIUM BUILDING.

1. Section of Berean Hall, devoted to education and the Lyceum. 2. Great Acoustic Dome and Proscenium Arch. Concealed above these are the 6,000 pipes of the great organ, their melody and harmony raining down through the myriad openings of the artistic fretwork. 3. Great Promenade Foyer, with 84 feet of exits. 4. Grand Entrance (Fifth Street), with a Beautiful Canopy of Wrought Iron and Verde Antique Bronze. 5. Upper Picture: The Choir Setting for Religious Services and Organ Recitals. Lower Picture: Proscenium Boxes, showing Sullivanesque decorations.

THE BUFFALO CONVENTION.

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that architecture, as the expression of the ideal, can materialize in but one or the other of two great manners: that of the articulated structure, unit added to unit, and that of the plastic mass. The most noble development in the first manner is in the architecture of masonry (brick or stone) and this development has reached its logical limit; in no way, except it may be in mere size, its least noble attribute, is it to be excelled.

And now comes the ghost of what might have been, and calls for an incarnation, feeling (if a giant can feel) that in reinforced concrete science is preparing a way which can be vivified with the spirit of art. If this feeling is substantiated, to the architect is opened up a new range of possibilities. The architect becomes in a sense a sculptor, a molder of monumental mass; not the fantastic figure who, at first with sharply insistent blows and then with infinite persuasive tappings, releases the form imprisoned in the block, but a creative constructor who builds up his ideal and shapes it by the irresistible though tender molding of mass and form.

The masonry-clad steel structure of to-day is an architectural anomaly, representing as it does rather a branch of engineering than of architecture; and it is doubtful if any treatment of the encrusting material, be it brick, stone or terra cotta, can make the structure architecturally interesting as compared, for instance, with the interest which attaches to a well designed brick cottage or stable even. The steel structure, however, will continue to occupy its own domain. But the call of concrete is heard inviting architecture to occupy an as yet undeveloped territory.

Though the use of concrete goes back into antiquity, plastic architecture would seem to be in the *veriest* infancy, and would seem also to be asking the genius of this age to give it perfect expression and make it worthy to stand with the architecture of the past and yet-to-come. Though the past be examined for precedent, little will be found. Rome used concrete in bulk—but undeniable evidence of a scientific use of the material is wanting. Rome employed masonry in bulk—but again evidence of a scientific use is wanting. Rome applied superficially the arts of other times and countries, but of itself left to posterity only monuments expressive of a highly temperamental force, breathing little or nothing of spirituality. The Spanish missions were built with rare feeling for mass and light and shade; but feeling swayed and science did not guide. With the science of to-day to guide, and the art experience of the past to illumine, into what logical, noble and beautiful forms should not concrete shape itself, to the end of an enduring, spiritualized architecture.

In this study your committee has taken no cognizance of the concrete block as a structural possibility, believing that such blocks, as well as the terra cotta used in the same manner, are mere imitations of stone, and when used after the manner of stone, are impossible in the architecture of sentiment, and, like all imitations of one material in another, are inimical to art.

The possibilities, even the esthetic possibilities, within the range of reinforced concrete construction, can hardly be over-estimated. Little beyond the introductory chapter has been written in the history of reinforced concrete, and every advance in the science of its manufacture and use will signal an advance along the line of artistic application.

Except in well defined types, designed to serve certain well defined uses, it is impracticable so to carry masonry construction beyond and behind the facade as to result in a homogeneous structure—wanting which architecture becomes but a hollow sound. The architecture of a reinforced plastic material may and logically will express itself throughout the entire structure to the remotest core. The unity, the truth, the harmony of the whole may in every part be manifested. Therefore, again the possibilities inherent in concrete present themselves alluringly to the architect to whom the art means as much as does the science of building.

The architectural brain is not so congested by the weight of pregnant thought that at a blow a Minerva shall issue forth, full fledged and full armed. That is not the history of the evolution of an architectural style. It will take time and struggle and developed artistic perceptions in this, as in former cases, to reveal the possibilities of beautiful and of monumental design.

Yet it is possible that in this, as in other ages, commercialism, itself so devoid of esthetic tendencies, will pave the way to the realization of an esthetic ideal. A material which holds in itself the qualifications for commercial use will in that very use reveal its esthetic possibilities. No material which puts into the hand of the architect power to reduce permanent mass and form, and add the enrichment of light and shade, color and texture, will long be ignored when science has made its use commercially possible. It would then seemingly remain only for science to demonstrate the practical value of reinforced concrete, in respect to its physical properties, and art must unfold whatever it holds of beauty.

The steel skeleton developed from commercial necessity, and to clothe and perfect that skeleton, the architect, naturally, used whatever means lay at his command; stone, brick, terra cotta and metal were called into requisition. To clothe the skeleton in one or another or all of these materials became a fixed habit with the architect. So that when concrete came into use not only was it ignored as a possible clothing for steel, but when the skeleton of reinforced concrete was set up, it was itself clothed after the existing fashion for steel. Such is the fatal force of habit. Granting to concrete the qualities ascribed to it, that it is fireproof, that it may be rendered moisture proof, that once in place it is not affected by atmospheric and climatic conditions, that it can be permanently colored, can be molded and chiseled, that it can be formed in place and need not be applied piece-meal—what better material could be sought for clothing the steel skeleton? And why the need of any cloak at all to such material, when it has been treated with any manner of decency or respect by the designed? So esthetically there would seem to be unlimited possibilities in reinforced concrete.

Although it has not been its purpose to study that especial phase, it seems to your committee that the esthetic possibilities inherent in terra cotta and faience as covering materials for the steel skeleton have not as yet been in the highest degree realized, while, as stated before, concrete as a possible covering has been ignored. Simultaneously with their development in the field already assigned to them, it is not inconceivable that ornamental terra cotta and tile beautiful in color and texture, and also sculptured stone, will be called upon to embellish and distinguish, though not in any manner to clothe or conceal the concrete structure. The presence of these materials may be needed as a saving grace in these early days of design in concrete, to save the designers from a too brutal conception of the forms they deem the material must necessarily take. There is an unfortunate though marked tendency now in what should be a refined and restrained domestic architecture to shape concrete, and its lath and plaster imitations, into the crude though characteristic forms of the old mission work. It is needless to say that these forms have no meaning outside of their original environment, and would not have existed there but for the exigencies of the case—the crude nature of the materials procurable and the absence of all skilled labor.

But to-day, with art and science coöperating, it would seem as though architecture were on the verge of an awakening. Commercial architecture with us is beginning to feel the thrill. Abroad, monumental architecture as well is showing signs of a renewed joy in life and structural concrete, both of itself and embellished with richer materials, furnished the new and seemingly adequate medium of architectural expression.

Following this paper was the lecture by Charles D. Watson, of Pittsburg, Pa., upon the subject of "Factory-made Concrete." This is a study that is being rapidly developed and one that contains no little interest to the practical concrete man. Mr. Watson illustrated his lecture with a large number of stereopticon views, showing factory-made joists, beams, and even floor slabs said to be less than one inch thick, yet capable of sustaining a test load of 150 pounds to the square foot. One view showed the model of a two-story house from the footings to the cornice, all built of factory-made members. The great advantage of absolutely known and controlled aggregates and the uniform conditions of temperature and curing methods clearly give the palm to concrete members made in a properly equipped factory superior to anything that could possibly be obtained in even the best field practice.

However, the cost of transporting heavy structural members long distances is admitted to be a great drawback, though even this might be more than offset by the advantage of quality and the diminished dead load, for with better work much lighter structural members can be safely used. Certainly this idea, already developed at the great Pittsburg plant of which Mr. Watson is the manager, is destined to change existing opinions and methods of study to a great extent.

The association then listened to an able address by Albert Moyer.

EXPOSED SELECTED AGGREGATES IN MONOLITHIC CONCRETE CONSTRUCTION

By Albert Moyer, Assoc. Am. Soc. C. E.

I wish to bring very prominently to your attention the fundamental principles underlying the employment of concrete from the standpoint of art. I wish it distinctly understood that I mean by this constructive art. Correct art is never dishonest. It is obvious and sincere. To the practiced eye that which looks right is right. Concrete employed as an imitation is bad art.

Concrete blocks, such as rock-face blocks, which are imitations of hand-chipped stone, is one of the worst forms of bad art. A concrete block should be obviously a concrete block and not an imitation of anything.

My subject, however, is monolithic concrete, which embraces reinforced concrete where reinforcing is necessary. The whole subject particularly treats of wall construction, either for hotels, private residences, schoolhouses, libraries, and such other forms of construction as require beauty of finish. If such walls are plastered on the surface, they become either an imitation of plaster on brick, or, if marked off into squares, an imitation of stone. The color is usually dead, no sparkle or life, the surface of the wall is unsympathetic, and not only exceedingly bad taste, but incorrect from an artistic point of view.

If you employ concrete, let it look like concrete, design for concrete, eliminate all thought of stone, brick, wood or plaster. Let the wall exclaim to the casual observer, "I am solid, strong, substantial, durable and constructed of concrete."

In discussing this subject, I wish to eliminate from your minds all thought of concrete such as you may see in retaining walls, bridge abutments and other work where this material has been employed without reference to an artistic effect, but instead try to picture a concrete of exposed selected materials, aggregates of different colored stones.

The aggregates used in producing such effects are various. To produce one effect two or three different kinds of stones, broken brick and gravel can be used. For another, still different aggregates producing different color effects and different texture. In the sample before us a light colored limestone was used, together with some trap rock dust. This concrete is composed of one part Portland cement, three parts trap rock screenings, all passing through a ½-inch mesh, graded in size from ¼-inch down to dust, and five parts of light limestone, all passing through ⅜-inch mesh and all collected on a ¼-inch mesh.

In this sample various other aggregates were used. It is unfortunate that the pictures do not show the colors, which are full of life and very beautiful.

In this sample I used gravel of light yellow color. The concrete being composed of 1 part Portland cement, 3 parts light colored stone screenings and 6 parts gravel pebbles, all of which would pass through a ⅝-inch mesh.

The concrete is tamped medium wet or can be poured into the forms very wet, left in the forms for 24 hours, at which time or possibly sooner the outside board forms are taken off. The surface then has the appearance of the ordinary dead mouse color concrete, a good deal of the mortar being plastered against the forms and showing on the surface.

This surface—the concrete being green—is scrubbed with an ordinary house scrubbing brush, unless the atmospheric conditions have caused the surface to become too hard, in which event it is scrubbed with a wire brush similar to those used in cleaning boilers.

After scrubbing over the surface once, water is sprayed on through a hose, and the surface is again scrubbed. This exposed the larger pieces of aggregates, in fact throws them slightly in relief, brushes off all the particles of cement not only from the surface of the stones but from the surface of each grain of sand composing the mortar binding together the various stones. The aggregates are thrown slightly in relief, possibly to the extent of a 16th or 8th of an inch, for in scrubbing, the mortar necessarily is not only taken away from the surface of the concrete, but the brush will dig back into the mortar to a slight extent. This gives a rough surface of accidentally distributed various colored stones, in sizes ranging from ⅜ inch down to particles the size of sand. This causes the mortar to sparkle with its natural beauty, making the whole surface alive with purpose and color.

Should this surface become stained by placing course upon course as the wall is erected, wash the wall off with water prayed on the surface by means of a hose each night as the day's work is completed, and after the wall is completed to the top, go over the whole surface with one part commercial muriatic acid and 4 to 6 parts water, applying this solution of muriatic acid with an ordinary whitewash brush having very little exposed metal. Leave the acid on the walls fifteen minutes to half an hour, after which wash off with a hose, and in places where the stains are most noticeable scrub the surface with an ordinary house scrubbing brush. This will cause the wall to be as full of life as was the natural stone from which the wall was made. The benefits to art derived by the use of such concrete are manifold.

The concrete which I have tried to describe composed of exposed selected aggregates, is to the casual observer obviously concrete, nay one can see at a glance that the whole structure is honest and what composes the formation. Therefore, we have devised a concrete which complies with all the fundamental principles and laws of good art, and is only limited in effect to the available materials in the locality in which the structure is to be erected.

I am firmly of the belief that this treatment of concrete will be the means of developing an original style of American architecture. Simplicity almost primitive is the keynote of successful concrete design. Exposed selected aggregates will very materially assist in such development.

We are all aware that concrete was used by the Romans and the Saracenic races. The writer had the pleasure of examining quite a considerable amount of this concrete last year in Southern Spain, Morocco and Italy, but nowhere could I find where concrete had been treated artistically. It is usually in mass construction, large battlement walls, 14 inches thick, or as a filler between courses of stone or brick. The present concrete is vastly different.

I wish to show you an example of the Spanish Moorish, the Pavilion of Charles the Fifth in the Gardens of the Alcazar, Spain. I use this as an illustration particularly because various colored tiles are employed for decoration of the exterior, and the red tile roof is used. This is about all that is similar between a house of original concrete design and the Spanish Moorish.

We, however, cannot attempt to discard precedent. The development of any style of decoration, art, music, sculpture or literature must necessarily be through the process of evolution. This, however, does not interfere with our developing through the process of evolution an original American architecture, provided we treat our material sincerely and honestly.

The picture of Spanish-Moorish architecture which you have just seen was original with the Moors. This style was developed within a period of 250 years. Some students can find very little precedent. Nevertheless it was an evolution. It was developed from the fact that they were composed of tribes of tent dwellers, who finally congregated into cities, and changed their dwellings from canvas to houses built of stone and brick.

The tent of Alexander the Great, obtained from the Arabs or Moors, was made of 50 golden poles carrying a roof of woven gold. The various apartments were separated by hangings embroidered in scarlet and white. This tent was even exceeded in beauty by one belonging to an Egyptian king, which was covered with golden eagles. The floors were covered with handsome rugs, the walls were hung with embroidered tapestries. The tent dwellers from the earliest time made use of hangings and floor coverings of great interest and beauty.

Thus the Moors in Southern Spain developed an original style of architecture which was not a copy. This is not Saracenic as is often claimed. In the Mosque at Cordova there is a wonderful forest of 1,240 slender columns of marble or jasper. Arch upon arch connect these pillars with the roof. The arches and walls are covered with decoration carved like lace work, either of plaster or solid stone, a perfect riot of color. The floors are of marble mosaic in rich geometrical designs. Decorative tiles were often employed on walls as a wainscotting.

They were a race which laughed and danced in the face of trouble, people of magnificent contracts, the expression of their character is found very prominently in their architecture and decoration. The slender pillars of stone are the tent-poles; the beautiful lace-like carvings decorated with various colors covering the walls are the embroidered tapestries; the stalacite pendants in plaster and the various colored arabesques and carved wood found on the ceilings are the pendant hangings. The richly decorated mosaic floors are the rugs. Thus we have an original architecture, not without precedent, but the precedent was not found in stone or brick, and the stone construction was not a counterfeit or imitation of canvas. It was a development from canvas to stone, and they were occupied in this development less than 250 years.

The time is certainly ripe for the development of American architecture from wood to concrete.

There can be no question but that the forests of North America will be depleted as far as economical and commercial purposes are concerned within the next twenty-five years. Within that period a residence built of wood will be as great a curiosity in this country as it is today in Spain southern France and Italy. Concrete is the lumber of the future.

In the picture which you now see before you, which is a house in Pittsburg, the pebbles were placed by hand in clay inside the forms after the concrete was tamped in the forms. The outside forms were taken down, and this clay was scrubbed away from the pebbles. You will note that such a wall is not artistic, although the effect is fairly good. This for the reason that the distribution of these pebbles is not accidental, they are prearranged, deliberate, and entirely too uniform to be natural.

The difference between the stucco finish, also mortar-faced concrete, and exposed selected aggregates, is that the stucco finish, even though scrubbed or treated with acid, would present to the eye too fine a grain for the large space of wall. This fine grain surface, even though of good color, becomes monotonous. Some will say that the finished block of granite shows a fine grain surface which is beautiful, forgetting that when set in a wall the surface of the wall is from convenience and necessity broken by the mortar joints. The surface of exposed selected aggregates gives a "basso relievo" effect, and their accidental, therefore natural distribution not only avoids monotony but brings about extreme beauty.

I wish to illustrate another method which can be employed by the use of selected exposed aggregates. An apartment-house in Alstone, Mass. The stone composing this house was manufactured by Emerson & Norris Company of Boston, Mass. It is presumed to be an imitation of granite. In reality it is not an imitation. It is natural stone artificially manufactured, having the appearance of granite, but as good as if not better in every particular.

As it bears a close resemblance to gray granite, it can be architecturally treated, the same as granite blocks. You will note that the belt course which was built in position has only horizontal joints which were put in for the purpose of giving them proper architectural lines, but as no vertical joints are shown, it is honest and precisely what it is intended to be.

The details shown illustrate how well the desired results were obtained. That part of the building which is cut up into blocks is honestly treated for the reason that the mortar joints show that they are blocks of stone; whether it be a manufactured stone or not is immaterial as long as it has the appearance of stone. If it looked like concrete with an attempt to imitate stone it would be very bad art, but as it is a natural stone artificially manufactured, we can stretch a point in this instance and claim that it can be successfully used to serve the purpose of correct architecture.

The development of an original American architecture from the employment of artistic concrete will certainly be of considerable advantage and benefit to the entire industry, and open up a new architectural era.

These ideas have been carried out in a residence designed by Tracy & Swartwout, architects, New York, built on Ridgewood Road, South Orange, N. J. I wish to use this residence not only as an illustration of the fact that original American architecture is possible, but that exposed selected aggregates furnish the basis for successful concrete design.

This house is designed to accord with the natural surroundings and expresses the material employed. It is not a copy, and is entirely original. People viewing this house, those not trained in architecture and art, invariably exclaim that it is either Spanish or Moorish.

The aggregates used in the house on Ridgewood Road are composed of one part Vulcanite Portland Cement, three parts limestone and marble screenings, about the size of sand, five parts of ¾-inch trap rock (a dark colored stone), and five parts 1-inch white marble chips. This surface was scrubbed as previously described. After the walls were completed it was washed down with diluted muriatic acid.

Such concrete is the reverse of that at present in general use. Instead of plastering the surface with mortar, all the mortar is removed from the surface, exposing to view honest concrete. It is not strange when we arrive at simplicity and correct method, not only is art obtained but future trouble eliminated.

We will diverge from the subject of art for a few moments and note some of the structural features.

The walls above the first floor beams were lined with porous hollow 2-inch terra cotta furring or partition blocks. These blocks were set inside the forms or molds similar to laying brick, an ordinary day laborer doing the work. The concrete was tamped in between the outside forms and the terra cotta blocks. These porous terra cotta blocks were previously thoroughly soaked with water. It was found that the blocks bounded perfectly to the concrete and could not be torn loose in any place.

To avoid any possibility of dampness, these blocks were waterproofed on the exposed surface with two coats of "Dehydratine," which not only clings with a perfect bond to the porous terra cotta blocks, but the plaster for the inside of the house hangs to this waterproof paint far better than to any lath which has as yet been devised. This furnishes a wall which is solid and substantial, warm in winter, cool in summer, damp-proof, and eliminates all possibility of condensation from the inside.

This wall was reinforced where necessary, particularly over windows, and in addition four horizontal courses of ¾-inch wire cable were imbedded in the concrete, running all around the building, tying the walls perfectly together, acting as a reinforcement against temperature stresses and making the house practically earthquake proof.

The selected aggregates used composed all of the concrete. They were not put against the outside forms by hand, but were mixed all through the concrete, thus giving an accidental distribution of white and dark particles far more beautiful than if the arrangement of the particles was deliberate.

The south porch with its square pillars and plain caps ornamented with handmade various colored tiles, glazed and unglazed, is noteworthy. This is an excellent example of the primitive which I believe is the thought which should be behind American architecture. The roof of this porch is a 6-inch slab reinforced with cars and expanded metal. This porch will be enclosed in glass in winter and screens in summer.

The fireplace on this porch, which is one of the illustrations, was built up with the wall, and is another excellent example of concrete design and originality. It was afterward decorated with tile mosaic of the Indian making fire, which was designed by Mr. Henry C. Mercer. This pattern, which is 20 inches in diameter, consists of pieces of clay burned in many colors superficially or throughout the body and unglazed. The tesserae are not rectangular as in Roman or Byzantine mosaics, but are cut in multiform shapes to suit the potter's process, and whose contours themselves help to delineate the design.

The roof is dull red Japanese pan tile. The tile being taken from the run of the kiln so that there are colors accidentally distributed throughout the whole roof ranging from dark purple to salmon color, the general effect being a dull red.

Beams supporting the roof were tied to the walls by bolts set upright in the concrete. The same method was used in tying the floor beams and girders to the wall so that no "battering ram" action would take place in case of earthquake.

The floor beams or joists were not set in the concrete, tight, but rested on and spiked to 4x4s fastened to the concrete by means of bolts set every 15 inches, these bolts being firmly anchored in the concrete. This method at first glance was open to criticism on account of the shrinkage of the wood, but on further thought, the shrinkage could not be as much as the pressure of the nut against the wood, they having been screwed very

The front balcony is another excellent illustration of concrete design, employed as a plastic material. This balcony is decorated with primitive burned tiles of pastel or earth shades. The model for this balcony was first carved in clay ¼-inch scale.

Decoration and color of the outside walls were provided for by panels of these various colored clay tiles and mosaics, glazed and unglazed. Size of the panels and their distribution were from drawings furnished by the architect. When the forms for the concrete walls were taken down, board negatives which had previously been placed to conform to the design of the panels were left in the wall until it had been thoroughly scrubbed. They were afterwards removed, thus leaving a 1-inch recess, in which handsome tiles were placed, they being set in mortar sometimes light color, sometimes darkened. As Mr. Henry C. Mercer aptly expresses it, "I paint my patterns with clay paint, but I draw my outlines with your cement." Each panel produced most artistic results and forms a very handsome combination with the color and texture of the concrete surface.

The color effect produced is glorious, and yet unobtrusive being of earth color and pastel shades of a very primitive nature. It is a true, artistic, picturesque monolithic concrete house. All nature makes friends with plain, solid, substantial construction. It harmonizes with the trees and landscape, even the mosses, vines and birds are attracted to it. With no straining for oddity, simply to be original, this house can well be said to be unique in this country; an expression of the material used. It is simple and dignified, the countenance is full of expression and alive with purpose. A feeling is produced of strength and repose; certainly an excellent illustration of the possibilities of concrete and successful concrete design, which is made possible through the use of Exposed Selected Aggregates.

The study of aggregates is perhaps the fundamental proposition in the entire study of Portland cement concrete today. Mr. Moyer has already contributed a number of papers, bearing upon sidewalks and floors particularly, that have come to be considered standard concrete literature. This paper, bearing upon the treatment of exposed surfaces, and the selection of aggregate materials therefore is timely and was well received.

Mr. C. W. Boynton's paper dealt with the sidewalk proposition in a very exhaustive manner. The discussion which followed opened up the question of sidewalk specifications again and the matter was not disposed of at the hour of closing.

THURSDAY MORNING SESSION.

Immediately on calling the convention to order the president called the section on streets, sidewalks and floors. Vice-President George L. Stanley read the specifications as previously prepared by the committee section by section, and each was amended and adopted after due consideration. At the hour of 10:30 the sidewalk discussion was still incomplete, so the section was adjourned for special committee session at 3 o'clock.

MAKING BLOCK—MAKING MONEY.

By Willis Pearson.

Much has been written on the manufacture of cement building-block, but I cannot recall ever having seen an article which would assist one in making a financial success of their plant beyond giving assistance in the technical construction of the block, and as I take it that you are not conducting your block business as a pastime, perhaps just enough suggestions to provoke a general discussion might not be out of place.

To begin with, systematize your business from top to bottom; see to it that every man has a definite work to do, and is held accountable for the way in which that work is done. Eliminate the "everybody's business nobody's business" idea. Require your superintendent to make daily reports to you of the amount of material used, wages paid and block made, which data, together with your general expense and depreciation items, will give you the basis for an accurate cost record, without which you cannot intelligently conduct business. My experience has taught me that the proper depreciation to charge off is about 10 per cent for buildings, 30 per cent for block machines, 20 per cent for machinery and 15 per cent for block cars.

After systematizing your business do not forget that a good ship does not necessarily guarantee a safe port; nor does a good system alone insure a successful business. A water-logged scow in the hands of a master pilot may fare better in the storm than a twin-screw ocean-liner manned by incompetents. You can't set the helm of your business barge in one fixed direction and expect it to guide you into the harbor of success. The shoals and rocks of unexpected conditions rise up in every mile of the sea. Only the skillful piloting that meets each danger as it arises can steer you safely through.

It's the man behind the wheel that brings the ship into the haven of profit. It's not the system alone, but intelligent direction of it, that produces results.

Systematize your aims and plans—but plan and aim your system.

It is a most regrettable fact that the history of the manufacture of cement building-blocks has resulted in a financial loss to at least 75 per cent of those who have engaged in it, and I am confident that this is due not to a lack of quality of product, but to either an ignorance of or indifference to good business methods.

When you place a superintendent in charge of your plant don't butt in and run it yourself, thereby depriving him of all initiative, but leave him alone and give him a chance to make good. If he doesn't, get a new superintendent.

Systematizing a manufacturing business reveals the necessity of creating two distinct departments, no matter how small or how large the plant may be—the department for the production of block, and the department for creating a demand for those blocks, or, in other words, production and selling. Put your superintendent in charge of the first, and you assume management of the second. Material for making factory superintendents is both cheap and plentiful, but the man who gets the orders is the fellow who really keeps the smoke coming out of the factory chimney. He is the engine that pulls the whole train. This work calls for concentrated energy, and it is just to this point where most of the failures may be traced. Instead of directing all our energies to the creation of business, we attempt to be superintendent in the morning and salesman in the afternoon, or half and half all the time. It can't be done, for "Much done, little accomplished," is both true and trite. If this condition exists in your business, pick out a superintendent as soon as you get home, and leave the routine work to him, for your place is on the bridge, and not down in the engine-room—in the office, and not in the factory.

Some one has truly said that while Opportunity knocks at least once at every man's door, the party inside has no right to expect the panels to be kicked in. And it may be added that if the expectant party is a blockmaker he had best not wait inside at all. The only way in which we can ever hope to catch a glimpse of Opportunity is to get outside the door and do a lot of active searching for her up and down the street.

I wish to disclaim any intention of posing as a business doctor, but these are some points which I have learned by experience.

L. C. Wasson read a paper entitled "Proportions and Methods in Mixing Concrete," which will be printed in next month's Rock Products.

Nearly every member present participated in the discussion, which was ably controlled by Mr. Wason.

E. T. Perkins of the United States Reclamation Service delivered an illustrated lecture upon the employment of concrete in the work already undertaken, completed and in progress under the supervision of the Government engineers. The construction of drains, aqueducts, reservoirs, dams, head gates, etc., in cañons and prairies, was shown upon the screen in colors. The field of operations previous to undertaking reclamation was shown, and the results were illustrated so as to show the effects of scientific reclamation. One field of alfalfa was illustrated showing piles of the legume so thick that a wagon could not be driven in between them, all grown in twenty-six days from the seed. Mr. Perkins stated that in this section ten crops of alfalfa can be raised in one year. This paper is one of the most valuable and instructive that has ever been offered to the National Association of Cement Users.

James L. Davis of New York read a paper entitled "Waterproofing Concrete Structures."

Special Committee on Creating a Class of Contributing Members.

This committee was organized with E. D. Boyer chairman, O. U. Miracle treasurer, and succeeded in drafting the following plan for providing the necessary funds for advancing the work of the association during the coming year. It was decided to submit a paper for voluntary contributions to the entire membership of the association, and under the following caption upwards of one hundred contributions have been subscribed.

Buffalo, N. Y., January 23, 1908.

We, the undersigned, members of the National Association of Cement Users, subscribe the sum of twenty-five dollars ($25.00) per annum to the treasurer of this association for the purpose of enabling them to employ a competent assistant at a sufficient salary, and for the further purpose of assisting in the financing of the association.

Members and other interested parties are invited to add their names to this subscription as promptly as possible, so as to provide funds for continuing the association's work along the lines already so clearly defined and needing the unceasing action of the officers and the committees to bring about the results that the association expects and desires to accomplish during the next season.

Address subscriptions to this fund to George C. Wright, secretary, Rochester, N. Y., or O. U. Miracle, treasurer of the committee, Minneapolis, Minn. This provides a means for every person or corporation interested in the promotion of the association's work to take a contributing part, and it is hoped that a prompt response to this provision will be generally accepted.

FRIDAY MORNING SESSION.

The last day of the convention program found the interest still unflagging. Indeed, the crowd constantly increased with each succeeding session, and in spite of the fact that two important committee meetings were attracting large numbers of the delegates, there was the usual full house in the concert hall when President Humphrey rapped for order.

W. L. Caldwell read a paper entitled "Metal Forms in Reinforced Concrete Construction."

CONTINUITY IN STEEL REINFORCEMENT OF CONCRETE STRUCTURES.

By E. P. Goodrich, New York.

Concrete structures exhibit the usual phenomena of elastic solids, especially when they are provided with a skeleton of steel, properly proportioned and distributed throughout the concrete mass, according to circumstances. In the construction of concrete sidewalks and of most retaining walls, especially if of massive design, special effort is made to reduce within certain limits the size of the parts which will act as units. In some arches, efforts have been made looking toward a similar result, but in structures of that class the present tendency seems to be to treat them frankly as continuous elastic structures, even though their detailed design is thereby rendered quite complicated. In such structures as lines of concrete pipe, separate units are being employed even when of large diameters, but most work is of the continuous or monolithic variety.

No half-way course is possible between these two classes of structures. If an arch is designed without joints, but the reinforcement is not arranged for a continuous structure, joints are almost certain to form in accordance with Nature's laws by the cracking of the work, and sometimes they may occur at points which even threaten the stability of the structure. At least they are often exceedingly unsightly. A concrete sewer is out of sight and usually so arranged that there is little danger of collapse should a few small cracks occur. But in this case another danger may exist. In a small city in a Middle Western State, a sewer was found to have become clogged so that it burst and flooded the cellars of adjoining property. Investigation showed that a root from a willow tree had entered the sewer through what must at first have been a very small crack, and had multiplied its fiber within the sewer to such an extent as to cause the trouble above mentioned.

The matter of building design will be more fully discussed a little later.

From even the two cases above cited it would seem all important when a concrete structure is to be constructed monolithic in character, so to distribute its reinforcement as to make it act like a continuous solid, and in its design treat it as an elastic structure subject to stresses and strains from its own weight, from the live load and its impact and variation in intensity, from changes of temperature, local settlement, etc. What follows will be almost entirely a discussion of the subject of continuity, as found in the structural members of buildings, it being taken for granted from this point onward that continuous structures should be erected with reinforcement designed to provide such static resistance as the continuous nature of the member demands.

A few concrete buildings have been erected in which the several structural members have been moulded on the ground and erected and set in place in the same manner in which timber and steel work is handled. In the majority of cases, however, it has been the endeavor to secure a monolithic structure, and this theoretically monolithic nature has been one of the points much advertised as a great advantage inhering in concrete work. This very condition of perfect continuity has some minor disadvantages. Sound and vibration are transmitted much better than in a less rigid structure, but the greater mass and the inherent nature of the propagating medium tend to absorb the vibrations so that at least one of these disadvantages is usually turned to a favorable property. A much more important point for consideration in this connection, is the fact that in structures composed of discrete members, innumerable joints naturally exist at which expansion and slight changes of position from deformation, can take place without endangering the structure, because brackets and other devices are provided to allow of such conditions. The first designers in reinforced concrete were so imbued with the ideas of the older types of structures that they thought of the several members of a concrete building as practically identical with those of all other types. The first regulations covering reinforced concrete work adopted by municipalities thus viewed this point as is shown by their specifying that a factor of one-eighth should be used in the design of beams, girders, and slabs. Very soon, however, trouble arose in buildings executed in accordance with such designs, which were being loaded to anything approaching their theoretically safe carrying capacity. Cracks occurred in the floor surface at the ends of beams and girders and slabs cracked away from beams in the same manner. These cracks were often ascribed to shrinkage or settlement or other factor, but in many cases were the necessary result of natural deformations of the structure. They showed that the same thing took place in concrete beams as happened in any other kind, but that allowance had not been made for such action. The next step was to require special reinforcement over points of support, to correct this trouble, and in order to secure some hypothesis for determining the amount to be used, advantage was taken of an observed fact that the factor one-eighth could be reduced to one-tenth for various reasons for moments at the centers of beams. Since one-fortieth measures the difference between this factor and the theoretical total, the amount of reinforcement thus determined was specified at the points in question.

When thus reinforced, a continuous beam possesses partial restraint at the ends. If a homogeneous beam of constant section be considered and one with a moment of inertia correspondingly less than a beam designed to carry the same total load when supported without restraint, it will be found that the theoretical slope of the neutral axis at the support is to be measured by the figure 7 as compared with 10 for a free beam. Such a slope would theoretically open a considerable crack at the top of almost any beam. Obviously if this condition existed, the steel designed to carry an amount of moment measured only by the factor 1-40 and at a stress equal to that of the steel near the bottom at the center, would actually be stretched much more than such a stress would deform it, and would consequently be carrying more than is above considered, with a correspondingly somewhat smaller slope of the beam. In a reinforced concrete girder, however, the moment of inertia is not constant throughout, and consequently the slope would probably be fully as great as first described above, even though the reinforcement was stressed beyond the permissible amount. If this actual stress happened to exceed the elastic limit of the top reinforcement, as may easily happen, a permanent deflexion would result in the top of the beam. Furthermore, a similar permanent set would have taken place in the concrete on the under side, below the crack, because of the high compression which would have taken place in the concrete. A repetition of the load would be likely to increase the first increment of deformation, and this increase would continue until a slope had been permanently secured, beyond which the added deflexions caused by ordinary loading would not cause stresses above the elastic limit of either the steel or the concrete.

But in order to attain this state of affairs, the stress conditions in the beam may have far exceeded safe limits, and many observations have shown this to have actually happened in more than one building.

The dangers incident to such tension cracks adjacent to points of support are numerous. They occur where the shear in the beam is a maximum and unless ample reinforcement is introduced to resist these latter stresses (as is really very rarely done), their unit values will run up far beyond limits usually considered safe. These initial tension cracks also serve as starters for others which tend to occur from the diagonal principal tensil stresses. Cracks of the latter variety are apt to develop suddenly, producing destructive failure in test specimens, and there is no reason to suppose that more immunity would be found to inhere in actual structures, should the load ever reach a critical value. With the formation of such cracks, the zone of compression is obviously restricted to the uncracked part of the concrete, and if the crack is driven across the initial position of the neutral axis, the unit stresses in the extreme concrete layer must exceed permissible, safe ones. Then, too, in the cracked condition, the concrete can have no tensil value and while this element is usually ignored in design work, its practical effect is well known to those who have made tests of beams and who have studied the subject of diagonal tension to any great extent. With a cracked condition, moreover, there is almost infinitely more opportunity for the reinforcing steel to be attacked by rust, with possible further incidental troubles. The few laboratory tests concerning this matter which have been made, principally in Germany, are inconclusive, and are best to be interpreted by the facts of actual experience, wherein rust has been discovered in connection with very fine cracks, when the metal was not covered with more than $\frac{5}{8}$ inch of concrete, as stated in a very late issue of a technical magazine.

The more steel is supplied over points of support (up to the theoretical necessary limit), the more are the above mentioned destructive tendencies reduced. Of course, with perfect restraint, twice as much reinforcement is required over supports as at the centers of beams. It is needless to state that this condition is almost never attainable at end bearings, although it is often closely approached at intermediate ones in large buildings, especially on the lower floors where heavy column loads give excellent stability to the members meeting at those points. With regard to the latter point, a column 16 inches square and stressed to 300 pounds per square inch for instance, will resist a moment of $28800 \frac{2}{3}$ without developing tension on one side of the base if it acts only with its vertical load. This will be equivalent to that of a uniform line load of 832 square feet distributed over a panel 20 feet square. Of course such a column, if of any considerable length would itself be bent to some extent by such a moment. This example tends to show the real action of the reinforcement usually installed and also indicates the necessity of a better form of splice on longitudinal rods in columns, than a piece of gas pipe slipped over the ends. On the upper floors, however, and in wall columns, special reinforcement must be installed if any real restraint is to be secured above that afforded by the tensile strength of the concrete itself.

The same general reasoning applies to slender columns which may be flexed by beams supported by them as has been given for beams with deficient reverse moment reinforcement. This is particularly true with regard to the columns which have been designed to support long span, heavy roof girders. There is no reason why such a combination cannot be analyzed, even as to the effect of unequal settlement, and the writer invariably makes an analysis of such designs, on the assumptions of rigid restraint at foundations, no shortening of the girder through its deflexion, and ignoring the bending effect on the column produced by the slight eccentricity of its load from the same cause. The problem then becomes one simply of a continuous beam over three spans with restrained ends, the parts having different moments of inertia. The solution is not particularly difficult, and by simple graphical methods the proper arrangement may be readily determined. It is usually found that more column steel is required than had been expected and that less end restraint of the main girders is secured than is often allowed.

Partial loads on continuous members over hinged supports give maximum positive and negative moment curves different from those for full uniform load. In a monolithic structure no supports are as flexible as a hinge should be and consequently the full values thus obtained can be modified with perfect safety. A considerable study given to the subject seems to show that the amount of steel indicated by the use of 1-12 in computing the moment of a continuous uniform load, placed at both the top and the bottom of a continuous member is ample. Its proper distribution may be closely approximated by dividing the axis of a parabola into thuds and making the top and bottom steel overlap the amount shown by the center thud. For various reasons, too, it is wise to run at least one rod from end to end of a continuous member along its bottom, in spite of the theoretical wastefulness involved. Some engineers also run one throughout along the top, and this is absolutely essential on short spans adjacent to longer ones. In such cases a careful analysis should always be made. Even in the floors of ordinary warehouses, deflexion experiments show considerable upward movement when alternate bays are loaded. Excessive loads, located in this way, might easily cause dangerous cracking in the unloaded bays, while the loaded ones were perfectly safe.

In a monolithic structure, secondary stresses from local settlement, shrinkage during setting, and changes of temperature are of much greater moment than in buildings constructed of discrete members with numerous joints. If local settlement takes place in a column, for instance, there is a tendency to produce worse cracking at points adjacent to the neighboring columns when the beams and girders are reinforced as simply supported ones, than when they are treated as continuous. Much more elasticity is secured, a better distribution of stress and consequent diminished likelihood of annoying cracking. Furthermore, when cracking does occur, it is less likely to be of a dangerous character than when the members are reinforced as simply supported ones.

The shrinkage which takes place from setting is not usually sufficient to cause any trouble, except at such points as connections between floor slabs and the deep ribs of girders and beams, unless very large long or deep stretches of work are placed in a single operation. Great care should be taken in the arrangement of the reinforcement at such points, the continuous type being altogether best even for floor slabs. In connection with such slab steel numerous stirrups should be provided to tie together the stem and the flanges of the T-beam which is the actual statical condition of the member when under load. It may not be out of place to remark at this point, that the actual effective width of flange in such T-beams is probably not nearly as wide as is assumed by many engineers. Care should be exercised in the design of the reinforcement of heavy floor girders to see that enough reinforcement runs through the flanges of the T, across the top, to provide for the secondary bending stresses which are developed by the shearing stresses close to the stem. This condition is usually overlooked in connection with the members which run parallel with the floor slab reinforcement. Members running in the opposite direction secure ample assistance from the regular slab rods. Also, that in continuous members, for ordinary loads, the neutral axis is so high in the vicinity of points of support, that little is to be feared from possible compression failures at such points unless the compression stress condition within the zone is aggravated by the approach of a diagonal tension failure. The latter is the one shown indirectly as the cause of rupture in all the tests of continuous members with which the writer is acquainted, and to obviate which special care should be exercised in design work. That the computed compressive stresses run very high shows either that the confined condition adjacent to points of support makes such stresses possible, or that wrong methods have been used in their calculation, or wrong assumptions made on which to base computations. All these are probably true. In designing the reinforcement for such continuous members, care should, therefore, be exercised to provide as ample steel as possible to assist the concrete in resisting compressure, shearing, and diagonal tensile stresses. Perhaps it is somewhat beside the point to state here that all tests of continuous members show great deficiency of the original concrete to withstand the developed diagonal tensile stresses without the addition of considerable steel in the form of stirrups or other heavier rods, either vertical or inclined, or both, and properly anchored at the ends. But the reinforcement for few buildings is designed with such an amount of reinforcement at those points, and if continuous members are to be considered at all, the present practice is open to considerable improvement. As was said before, because structures remain standing is no criterion of their proper design and construction. The condition of numerous country highway bridges is a notorious example of the existence and continued use of sometimes actually dangerous structures.

Change of temperature is a potent cause of innumerable, unknowable, secondary stresses in many structures. In such buildings as tanks and long walls in which cracks are inadmissible, absolute continuity of reinforcement is essential. Nothing further need be said concerning such structures, except that it is not usually advisable to reinforce retaining walls so as to prevent cracking. Even where water tightness is necessary it seems wisest usually to undertake to secure it by the employment of a watertight expansion joint, together with a waterproofing by some method in connection with the portions of wall between joints. To be sure, in one instance of a reinforced concrete face for a high rockfill dam in the Sierra Nevada Mountains, a recommendation was made to carefully reinforce areas aggregating approximately 20,000 square feet, rather than to make use of waterproof expansion joints under hydraulic heads over one hundred feet high.

In buildings of relatively small dimensions as to ground area, no expansion—or rather—contraction joints are necessary, especially in the upper stories. In long buildings, some joints may be deemed advisable in order to obviate the heavy tensile secondary stresses which must sometimes exist and which show themselves by cracks, sometimes at unsightly and occasionally at dangerous points. In small buildings the employment of numerous distributing rods through the floors at right angles to the regular carrying rods will usually be sufficient as far as the floors themselves are concerned. Around window and door openings, special reinforcement should always be provided to prevent the formation of the cracks which often start at all four corners and extend for short distances into the walls. Roofs are subject to extraordinary changes of temperature in their several parts, and need the greatest of care in the design of their reinforcements, especially when the slabs are treated as the flanges of long span roof girders.

In larger buildings, clean out joints may be installed and can best be placed at the centers of panels by providing cantilever beams as girders half a span in length on each side. Such joints should always be covered with an elastic water-proof coating to shed the water falling on the floors in case of fire.

This discussion has been mainly on the subject of the prevention of cracks, a series of prescriptions for the overcoming of certain symptoms. While simple tension cracks on the bottom of beams at their centers are not usually at all dangerous, since they commonly develop at comparatively low steel stresses, still, the owner is not aware of this fact and is not readily convinced that there is no real defect when his building commences to crack. He wants a perfect structure and is entitled to receive it, particularly when possible danger of the formation of rust exists when cracks have formed, and more particularly when a slightly different arrangement of reinforcement would entirely eliminate the fancied or real trouble in question.

Logic thus seems to dictate that all structures which are at all monolithic in character, thus having members continuous over supports or through floor levels, should have their reinforcement so designed and placed as to make them act under all load conditions as their original monolithic nature would make them start to act.

The discussion of the two foregoing papers might be called the inning of the reinforced concrete branch of the industry. Never before was such an aggregation of concrete engineers of distinction gathered together, and they were not slow about developing the practical points contained in the papers. It was an occasion when the best concrete brains of the country were all gathered together, and each man gave his experiences in detail for the benefit of all the others. The full stenographic report of this discussion will make a very valuable document, both by reason of the practical subjects taken up as well

EVENING SESSION, JANUARY 24.

REINFORCED CONCRETE FROM THE CONTRACTOR'S STANDPOINT.

By Henry H. Fox.

The general problem before the contractor in reinforced concrete is to make the best possible reinforced concrete at the least possible cost. The first part of this discussion will deal with methods to be followed and precautions to be observed in order to attain excellence of workmanship; the second part, with methods to be followed in order to attain this excellence cheaply.

To make the best possible reinforced concrete it is necessary:

1. That the forms should be strongly built, smoothly finished and as nearly as possible water-tight, and should be left in place until the concrete is self-supporting.

2. That the reinforcement should be designed to relieve the concrete of all stresses which concrete cannot safely withstand, and to be amply protected from fire and weather by concrete on all sides; that the reinforcement should be so securely fixed in place before concreting that the concreting will not disturb it.

3. That the concrete should be mixed and placed in such a way that the final product will be homogeneous and without voids.

First—Forms should be built of matched and dressed lumber and should be greased to make them part easily from the concrete. Their construction will be described in some detail in the second half of this paper. The length of time which should be allowed to elapse before removing forms depends upon two factors—the weather, and the load to which the member in question will be subjected upon removal of the forms. The fact that the concrete sets more rapidly the warmer the weather needs no elaboration. It is however never out of place to utter a warning against taking risks with concrete in cold weather. I suggest that very valuable information might be obtained from compressive tests on a series of concrete blocks, No. 1 being kept at a temperature of 30 degrees for one month after making, and being then tested; No. 2 at 35 degrees; No. 3 at 40 degrees, etc. Scratching concrete with a knife gives one a rough idea of its strength, providing one scratches often enough to become thoroughly familiar with the behavior of concrete under the knife. With regard to the second factor influencing the time which should elapse before removing forms, it may be said in general that the nearer the load to be sustained approaches the load for which the member was designed, the longer the forms must remain. Thus the forms for an overhanging cornice should remain in place longer than the forms for almost any other member, because the dead weight of the cornice is a very large percentage of the total weight which it is designed to carry. By similar reasoning, roof forms should remain longer than floor forms; floor forms longer than column forms; column forms in the top story of a building longer than column forms in a lower story, and column forms in general longer than footing forms.

It is very important that forms should be so designed that the column forms may be removed without in any way disturbing the supports of the beams and girders bearing on these columns. In this way a defect in a column may be detected and remedied before any load is brought to bear upon the column. In removing beam and girder forms, the posts should be removed from only one beam or girder at a time, and as soon as the form for this beam or girder is removed the posts should be immediately replaced. By this procedure danger of failure of concrete through poor workmanship is much diminished, as a defective member is supported by the members on either side of it until the defect may be remedied. The practice of removing all the posts under a floor at the end of a given period—one, two or three weeks—without pausing to remove the forms one at a time, examine the workmanship and replace the posts, cannot be too strongly condemned, both because of the possibility of defective workmanship and because the concrete floor, even if not defective, may not be strong enough to carry, in addition to its own weight, the weight of the one or two floors which may, by the time the forms are removed, have been constructed above it.

There is less danger in taking down column forms when the concrete is thirty-six hours old and floor forms when the concrete is five days old, if the posts of each member are removed separately, and as soon as possible replaced, than there is in knocking out all the posts under a large piece of floor in three weeks. Legislators who frame laws aiming at safety in concrete construction should bear this in mind.

It is of the first importance that the foreman in charge of removing forms should be of a high order of intelligence, and a man who can be relied upon to obey orders literally, for the reason that a mistake on his part is more likely to cause damage to life and property than a mistake on the part of any other foreman.

Second—Reinforcement should be designed to take all tensile stresses which occur in a reinforced concrete structure. Whether the reinforcement shall carry shearing or compressive stresses depends upon the conditions in each particular case.

Tensile stresses occur horizontally in the bottoms of beams, and, in the case of continuous beams, in the top of the beams over supports. They occur diagonally in every other part of a beam except the top. The horizontal tensile stresses are taken by horizontal bars. The diagonal tensile stresses are best taken—as most authorities are now agreed—by diagonal bars. As the horizontal tension is less at the end of a beam than in the center, it is obvious that if there are two or more bars in a beam, one of the bars which takes the horizontal stress at the middle of the beam may be deflected to take the diagonal tension near the ends of the beam, and in the case of continuous beams the horizontal tension over the supports. Thus are developed the familiar bent bars now in common use.

Shearing stresses occur chiefly near the supports of beams. The vertical shear is generally taken partly by the concrete, partly by the tension bars which run over the support. Horizontal shear is taken partly by the concrete, partly by the diagonal tension bars and partly by stirrups.

Compressive stresses occur chiefly in the tops of beams and in columns. Compression in beams is almost always taken by the concrete alone. Compression in columns is taken partly by the concrete, partly by vertical steel bars. Vertical compression in columns induces a horizontal tension or bursting stress. Concrete is so weak in tension that a concrete column without reinforcement usually fails in tension, either by bursting or by buckling. The tendency to buckle is best resisted by vertical steel bars; the tendency to burst by steel hoops or a steel spiral near the surface of the column.

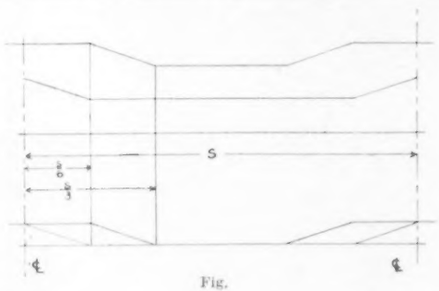


Fig.

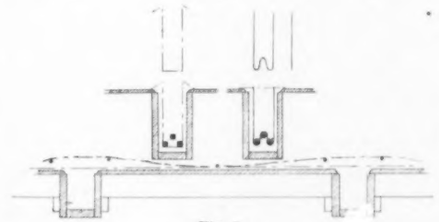


Fig. 2.

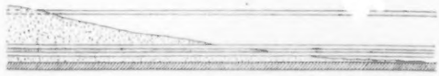


Fig. 3.

Fig. 2 shows a method of holding steel in place in a typical beam containing three tension bars. Note that the stirrups touch the forms only in two points and are, therefore, well protected against fire. The stirrups should not be relied upon to support the tension bars in place, but hangers should be used. As these hangers are of no further value after the concrete is in place, the fact that they are supported directly on the forms and are thus not fireproofed is of no importance. The middle portion of tension bars in beams and girders is thus held in place by hangers; the ends are held in place by being laced with wire to one another and to the vertical reinforcement in the columns. The bars in the floor slab are supported off the forms, as follows: In order to obtain continuous action over beams every alternate tension bar in the floor slab is sprung up where it crosses a beam, being supported at the edge of each beam by a short piece of band iron about 1½ inches narrower than the thickness of the floor slab, and bent to an angle of about 60 degrees, so that it will stand on edge by itself. In the middle of each span a bar runs at right angles to the tension bars, on top of the tension bars, and is held at any desired distance above the floor by staples into the floor cover and by the lifting tendency of the tension bars which are sprung up over the beams. The other tension bars are then raised from the floor by lacing them with wire to this central bar.

To insure fireproofing in columns, four sticks are used in tamping the concrete in columns, and these sticks are run down one on each side of the column between the hoop or spiral reinforcement and the form, thus insuring an amount of fireproofing equal at least to the thickness of the stick. The vertical reinforcement is placed inside the hoop or spiral reinforcement.

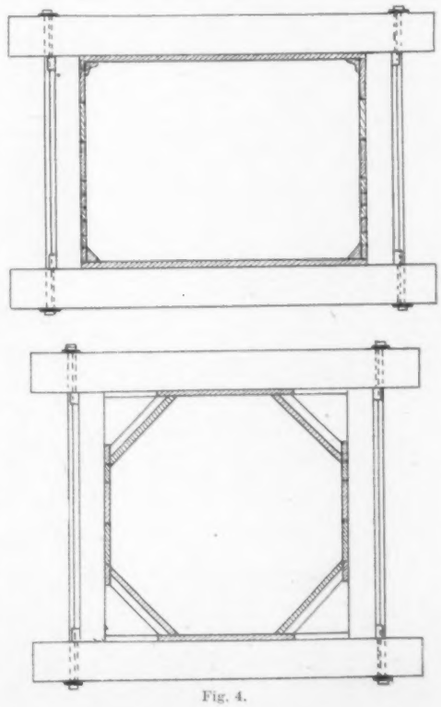


Fig. 4.

Commercial methods of bending steel to the shapes above mentioned will be considered in the second half of this paper.

Third—How to mix concrete well, by hand or by machine, needs no discussion. How to place it well is another matter. In the case of floors the trick is simple. Concrete should not, unless it is absolutely necessary, be dumped from a wheelbarrow directly against the form, but should be dumped on the soft concrete already in place. The mortar, flowing more freely than the stone, keeps always ahead of the mass, and stones falling in this mortar find a perfect bed; whereas if a barrowful of concrete is dumped into a dry beam the stones often become jammed between the forms and the steel and form a pocket into which the mortar does not enter.

A few years ago I visited a very large concrete job on which the old-fashioned specifications were in force—that concrete must be placed in thin layers. Nobody on the job seemed to know the trick of placing concrete properly, and consequently the contractor, in order to obtain smooth workmanship, was placing an inch or two of clear mortar in the bottom of all beams and girders before filling them with concrete. The expense entailed by this may be imagined.

The place to dump the first barrowful of concrete when starting a piece of floor is either on the floor slab or in a column. Fig. 3 will show the reason.

This slide illustrates the action of concrete in a beam being filled. It also illustrates a condition in which a beam should not be left for any length of time. As long as the mass is kept moving it will be homogeneous; but if it is allowed to set in this shape two evil results will follow: First, the cement and water, the most fluid part of the mass, will flow forward, leaving behind a layer consisting chiefly of sand, with which the concrete, subsequently placed, will not mix, and which has very little value as fireproofing; second, the scum which rises to the surface of wet concrete contains the finest dust present in the sand and stone, and therefore sets with a very smooth, glassy surface to which fresh concrete will not adhere. This joint, therefore, if work is stopped on it long enough to allow the scum to harden, will be very weak in shear and tension.

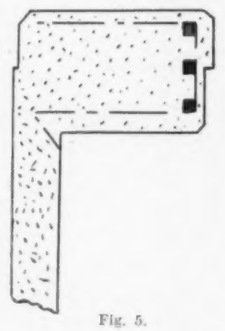


Fig. 5.

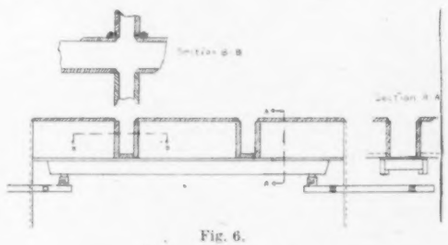


Fig. 6.

Fig. 5 shows one way of designing a beam on the outside of a building to make water-tight the joint between the beam and the wall resting on it, and between the beam and the window beneath it.

In concreting columns it is necessary to proceed slowly at the bottom of the column and to tamp the first foot with great care. After the mortar flushes to the surface over the entire section of the column, there is little danger of voids being left in the part of the column above the first foot, if a sufficiently wet mixture is used. Walls should be similarly handled.

Economical methods of handling forms, steel and concrete will now be considered.

Fig. 4 shows sections of two typical column forms. The exterior column is usually made square for architectural reasons. The interior column is octagonal, partly for architectural reasons, partly to save concrete. This saving is due to the fact that in a column reinforced with a spiral the concrete outside the spiral is not figured as adding compressive strength to the column; and therefore, if this column is square, the concrete in its four corners is wasted. Of course, the question arises whether the concrete saved pays for the additional carpenter work. As a rule, the two items almost counterbalance each other, so that the matter of appearance is more important than the matter of economy.

These two sides of the columns are held together, as shown, by bolts; the opposite two sides by hardwood wedges between the bolt and the form, as close as possible to the end of the bolt. It will be noticed that in some cases the sides are made up of narrow strips. This is to facilitate the reduction in size of the columns from floor to floor. In warm weather there is no need of having more column forms than one complete set for one story, even when work is proceeding at the rate of a story in five or six days. In a ten-story building each column form is then used ten times, once in each story. Each of these narrow strips represents the reduction in diameter of the column from one story to the next. It is of course much cheaper to have these strips ripped beforehand in the mill than to have a carpenter rip off a strip for each successive story. The outside and inside of the exterior column form are not made up of narrow strips for the reason that exterior columns are usually the same width from basement to roof. To reduce the section of an exterior column only the thickness is reduced.

Fig. 6 shows the section of a typical floor. Note the method of supporting this member, the "girder bottom," on the horizontal clamps of the column form, and of supporting the beam forms on the girder bottom. Thus all the forms for a floor may be erected before any posts

are put in. The posts are put in at any time after the beams are in place, without any lateral bracing whatever. In this way time and labor are saved. If 2-inch lumber is used for beams, the beams must be at least 2 inches shallower than the girds, in order to allow the beam form to be supported by the girder bottom.

This wedge-shaped piece is a "key" inserted to facilitate removal of form. The flat cover or panel which supports the floor slab is better than the box-shaped type, for the reason that any slight errors in line are taken up at the junction between cover and beam side, and a slight variation in this dimension is not conspicuous.

In removing forms the column forms are first removed. As has been said, the details about the tops of column

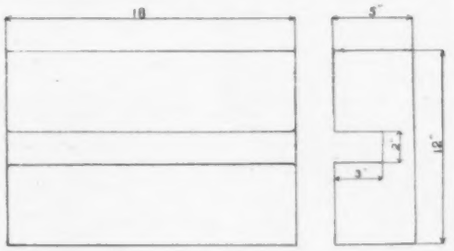


Fig. 7.

forms should be so designed that they may be removed without in any way disturbing the beam and girder forms. Next, the posts are taken from under the girder. The girder bottom then drops. The nails are drawn from the key, which is nailed only to the girder side, the key is knocked out, the posts are taken from under the beam, the so-called "spreaders" are knocked from under the cover, and the beam form comes down in one piece. The girder sides, which are beveled at the ends, come out easily, as does also the cover, which is beveled on all four edges.

Fig. 5 shows a method of supporting exterior column forms and shows some typical exterior wall forms.

A circular saw will effect economy in a building of moderate size, especially if the same engine or motor may be used to run the saw and other machines, such as a boring machine, a steel hoist, a grindstone or a shear.

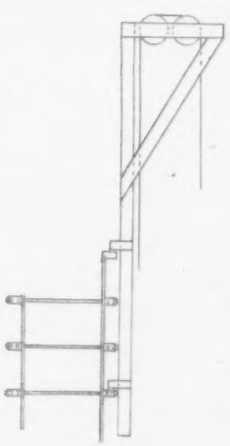


Fig. 8.

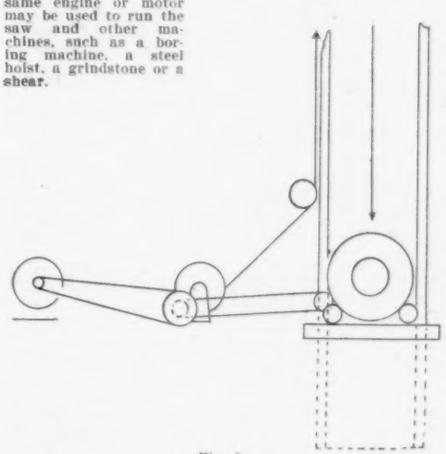


Fig. 9.

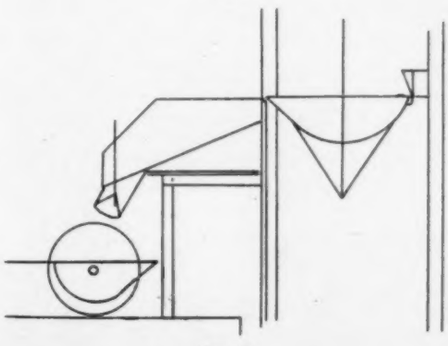


Fig. 10.

In warm weather, with a complete set of forms for one story, a speed of construction of one story in eight or nine working days may be attained. With one complete set of column forms and a set and a half of floor forms a speed of a story a week may be attained. The size of the building in plan makes very little difference.

In the discussion of methods of handling steel the first question is, To what extent shall machinery be used in bending bars? At the present day there is, so far as I know, no machine which bends tension bars for beams and girders as economically as they can be bent by hand. For one thing, the cost of handling the bars to and from the place of bending is a large percentage of the cost of bending, and this cost would remain the same in either case. The decisive reason is, however, that the number of possible shapes of bent bars is infinite; the number of different shapes required in one building is very large, and a machine to be efficient would have to be capable of rapid adjustment from one shape to another and consequently complicated.

A machine can be made to bend stirrups and hangers economically, as they are light and of smaller variety than tension bars.

In making spirals two processes are involved: First, bending the steel—which is usually in the form of wire—to the required diameter; second, spacing the coils to the required pitch and fastening them so rigidly to longitudinal bars that this pitch will not be disturbed in handling. The first process is accomplished more economically by machine, the second usually by hand.

Fig. 7 shows a simple form of block for bending beam and girder bars. The block is attached rigidly in a horizontal position to a bench, the bar is dropped in the slot, a piece of extra heavy pipe is slipped over the end of the bar, and two or three men bend it to the required angle. This bending block may be made of an iron plate with two angles riveted to it back to back to form the slot. Stirrups when bent by hand are bent on such a plate, the angles of course being small and only far enough apart to admit a bar of the size used for stirrups. A block for bending stirrups may be made small enough to slip into the pocket.

Spirals are made up on a simple wooden reel, the requisites of this reel being that it should be rigid, adjustable for different diameters and collapsible to allow the finished spiral to be easily slipped off.

Whether power other than hand-power should be used to hoist the reinforcement to the floor where it is to be used depends upon the height of the building and the quantity of steel on each floor. The wages of an engineer for one day will pay for a great deal of hoisting by hand. In case the job is large enough to warrant installing a power hoist, a convenient form of derrick is shown in Fig. 8. It is of course necessary to have steel on a floor before concrete; therefore, the necessity of having a derrick light enough to be attached to the forms before they are filled is apparent. The strain of the fall-rope on the derrick pulls the column out of plumb less than an inch, and this displacement is easily recovered with a guy-rope and turn-buckle before concreting.

Fig. 9 shows a typical layout of concrete mixer and hoist. You will note that no hopper is shown for charging the mixer. The question whether or not a charging hopper shall be used depends on several things. Unless it is possible to set the mixer several feet lower than the storage of sand and stone, some kind of hoist must be arranged to fill the hopper. This means additional machinery and generally the wages of an additional engineer. In New York City one of the obstacles to setting a mixer much lower than the storage piles is tide-water. Basement floors in New York are usually laid as near tide level as possible. During the construction of a building the basement is used for storage of sand and stone, and in order to set the mixer much lower than the basement floor an expensive water-proof pit must be constructed. A charging hopper of course makes it possible to charge the mixer more rapidly; but the fact should be borne in mind that no time is saved by charging the mixer more rapidly than the concrete can be taken away. The mixer should be set so low that the wheelbarrows run on a level grade or slightly down-grade in feeding the mixer.

In the case shown here the mixer is driven from the shaft of the hoist, and this shaft, from the motor.

Fig. 10 shows the side view of the framework in which the bucket runs. How large a mixer to install depends upon the rate at which concrete is to be used. An ordinary mixing plant will turn out easily forty batches per hour, and may be made to turn out sixty batches if the hoist is designed to take it away as fast as that. In laying out a schedule for concreting attention should be given to the fact that speed makes for economy, for the reason that there are several special men in a concrete gang whose wages remain the same regardless of the amount of concrete placed. These are an engineer, a foreman and at least three laborers—namely, one throwing water into the mixer, one dumping the mixer and one loading the wheelbarrows up on the floor. The sum of their wages at New York rates is $16.60 per day. If eighty yards are mixed in a day these men add to the cost of mixing about 20 cents per yard; if 160 yards are mixed they add only 10 cents per yard.

With regard to plant in general, it may be said that many contractors make the mistake of installing more machinery than is warranted by the quantity of material to be handled by this machinery. For example, on a piece of concrete work containing about 1,500 cubic yards of concrete, which I once visited, $10,000 had been spent in plant before a yard of concrete was mixed. At least $8,000 of this was wasted; for although the unit of costs may have been made less than they would have been if more primitive methods had been employed, the total costs, including the cost of installation, were much greater. The machinery did not have enough to do to pay for itself. To determine correctly the kind and quantity of machinery to use, a contractor must have both good judgment and a thorough knowledge of costs.

Mr. Fox is superintendent of the Turner Construction Company of New York, and his paper was illustrated with a large number of stereopticon views, which cannot now be reproduced. He showed the structural elements in a large variety of finished work located near the metropolis, and exemplified the treatment of surfaces and the disposal of ornamentation in some of the best reinforced concrete work extant. He had the entire subject of the paper as well as the illustrations so well in hand, and covered the matter so thoroughly that there was little left for discussion except a few questions calling for mere details of explanation.

The report of the committee on fireproofing and insurance by William L. Bailey of Boston was read and filed.

REPORT OF COMMITTEE ON LAWS AND ORDINANCES.

By H. C. Henley, Chairman.

Gentlemen and Members of the National Association of Cement Users:

At the last annual meeting of the association, this committee submitted a proposed ordinance governing cement construction for buildings. This ordinance was referred to the Specification Committee.

The National Board of Fire Underwriters, during the past year, has submitted an ordinance covering the construction of buildings of concrete. This ordinance will be adopted in some cities and used as a basis for ordinances in other cities. This ordinance is submitted with the recommendation that it be referred to the Specification Committee for further report to the association.

Requirements for reinforced concrete or concrete-steel constructed buildings, recommended by the National Board of Fire Underwriters:

The term "reinforced concrete" or "concrete-steel" in this section shall be understood to mean an approved concrete mixture reinforced by steel of any shape, so combined that the steel will take up the tensional stresses and assist in the resistance to shear.

All the requirements herein specified for protection of steel and for fire-resisting purposes shall apply to reinforced concrete filling between rolled-steel beams, as well as to reinforced concrete beams and to entire structures in reinforced concrete. Any concrete structure or the floor filling in same reinforced or otherwise, which may be erected on a permanent centering of sheet metal, or metal lathing and curved bars or a metal centering of any other form, must be strong enough to carry its loads without assistance from the centering, unless the concrete is so applied as to protect the centering as herein specified for metal reinforcement.

Exposed metal centering or exposed metal of any kind will not be considered a factor in the strength of any part of any concrete structure, and a plaster finish applied over the metal shall not be deemed sufficient protection.

All concrete for reinforced concrete construction whenever used in such buildings must be mixed in a machine which mixes one complete batch at a time, and entirely discharges it before another is introduced. At least twenty-five complete revolutions must be made at such a rate as to turn the concrete over at least once in every revolution for each batch.

Before permission to erect any concrete-steel structure is issued, complete drawings and specifications shall be filed with the Commissioner of Buildings, showing all details of the construction, the size and position of all reinforcing rods, stirrups, etc., and giving the composition of the concrete.

The execution of work shall be performed by workmen under the direct supervision of a competent foreman or superintendent.

All forms and centering for concrete shall be built plumb and in a substantial manner with inside surfaces smooth and made tight so that no part of the concrete mixture shall leak out through joints, cracks or holes, and after completion shall be thoroughly cleaned out, removing shavings, chips, pieces of wood and other material, which should not be permitted in forms.

The reinforcing steel shall be accurately located in forms and secured against displacement while the concrete is being placed and tamped.

Concrete shall be placed in forms as soon as practicable after mixing, and in all cases immediately after the addition of water.

Whenever fresh concrete joins concrete that is set, or partially set, the surface of the old concrete shall be roughened, cleaned and thoroughly slushed with a grout of neat cement and water.

Concrete shall not be installed in freezing weather; such weather shall be taken to mean a temperature of thirty-two degrees Fahrenheit or lower; concrete shall not be allowed to freeze after being put in place, and, if frozen, shall be removed.

The time at which forms and centering may safely be removed will vary from twenty-four hours to sixty days, depending upon temperature and other atmospheric conditions of the weather; the time for such removal to be determined by the Commissioner of Buildings.

The concrete shall be mixed in the proportions of one of cement, two of sand and four of other aggregates as before provided; or the proportions may be such that the resistance of the concrete to crushing shall not be less than 2,000 pounds per square inch after hardening for twenty-eight days, but for reinforced or plain concrete columns the mixture shall not be leaner than one part of cement, two of sand and five of the coarser aggregate in any case. The tests to determine this value must be made under the direction of the Commissioner of Buildings. The concrete used in concrete-steel construction must be what is usually known as a "wet" mixture.

Only high-grade Portland cements shall be permitted in reinforced concrete or concrete-steel constructed buildings. Such cements, when tested neat, shall, after one day in air, develop a tensile strength of at least 300 pounds per square inch; and after one day in air and six days in water shall develop a tensile strength of at least 500 pounds per square inch; and after one day in air and twenty-seven days in water shall develop a tensile strength of at least 600 pounds per square inch. Other tests, as to fineness, constancy or volume, etc., made in accordance with the standard method prescribed by the American Society of Civil Engineers, may, from time to time, be prescribed by the Commissioner of Buildings.

The sand to be used must be clean, sharp grit sand, free from loam or dirt, and shall not be finer than the standard sample kept in the Department of Buildings.

The stone used in the concrete shall be clean, broken stone, of a size that will pass through a ¾-inch ring, or good gravel may be used in the same proportion as broken stone, or broken hard bricks, or terra cotta, or furnace slag, or hard clean clinkers may be used.

The steel shall meet the requirements of Section 21 of this Code, which is as follows:

"Steel. All structural steel shall have an ultimate tensile strength of from 54,000 to 64,000 pounds per square inch. Its elastic limit shall be not less than 32,000 pounds per square inch and test specimens, ruptured in tension, must show a minimum elongation of

not less than 20 per cent in eight inches. Rivet steel shall have an ultimate strength of from 50,000 to 58,000 pounds per square inch.

Concrete-steel shall be designed in accordance with the following assumptions and requirements:

(1) The adhesion between the concrete and the steel is sufficient to make the two materials act together; the unit value of the adhesion is at least equal to the unit shearing strength of concrete.

(2) The design shall be based on the assumption of a load four times as great as the total working load (ordinary dead load plus ordinary live loads), producing a stress in the steel equal to the elastic limit, and a stress in the concrete equal to 2,000 pounds per square inch.

(3) The modulus of elasticity of concrete at 2,000 pounds per square inch is equal to one-eighteenth of the modulus of elasticity of steel.

(4) The steel takes all the tensile stress.

(5) The stress-strain curve of concrete in compression, when the stress in the extreme fibre is 2,000 pounds per square inch, may be assumed.

(a) As a straight line.

(b) As a parabola with its axis vertical and its vertex on the neutral axis of the beam, girder or slab, or

(c) As an empirical curve with an area one-quarter greater than if it were a straight line, and with its center of gravity at the same height as that of the parabolic area assumed in (b).

(6) The assumption belonging to the common theory of flexure, where not modified by any of the foregoing, will apply.

In the design of structures involving reinforced concrete girders and beams, as well as slabs, the girders and beams shall be treated as T-beams, with a portion of the slab acting as flange, in each case. The portion of the slab so acting shall be determined by assuming that in any horizontal-plane section of the flange, the stresses are distributed as the ordinates or a parabola, with its vertex in the stress-strain curve and with its axis in a longitudinal vertical plane through the center of the rib of the T.

The shearing strength of concrete, corresponding to a compressive strength of 2,000 pounds per square inch, shall be assumed at 200 pounds per square inch.

All reinforced concrete T-beams must be reinforced against the shearing stress along the plane of junction of the rib and the flange. Where reinforced concrete girders carry reinforced concrete beams, the portion of the floor slab acting as flange to the girder must be reinforced with bars near the top at right angles to the girder, to enable it to transmit local loads directly to the girder and not through the beams, thus avoiding an integration of compressive stresses due to simultaneous action as floor slab and girder flange.

Concrete indirect compression shall not be stressed, under the working load, more than 350 pounds per square inch. Reinforced compression members shall be designed on the assumption that this stress in the concrete will be simultaneous with one of 6,000 pounds per square inch in the steel.

In the execution of work in the field, work must be so carried on that the ribs of all girders and beams shall be monolithic with the floor slab.

In all reinforced concrete structures special care must be taken with the design of joints to provide against local stresses and secondary stresses due to the continuity of the structure.

In the determination of the bending moments due to the external forces, beams and girders shall be considered as simply supported at the ends, no allowance being made for continuous construction over supports. Floor plates, when constructed continuous and when provided with reinforcement at top of plate over the supports, may be treated as continuous beams, the bending moment for uniformly distributed loads being taken at not less than WL/10; the bending moment may be taken at WL/20 in the case of square floor plates which are reinforced in both directions and supported on all sides.

When the shearing stresses developed in any part of a reinforced concrete or concrete-steel constructed building exceed under the multiplied loads the shearing strength as fixed in this section, a sufficient amount of steel shall be introduced in such a position that the deficiency in the resistance to shear is overcome.

When the safe limit of adhesion between the concrete and steel is exceeded, provision must be made for transmitting the strength of the steel to the concrete.

Concrete-steel may be used for columns in which the ratio of length to least side or diameter does not exceed twelve. The reinforcing rods must be tied together at intervals of not more than the least side or diameter of the column.

The contractor must be prepared to make load tests on any portion of a reinforced concrete or concrete-steel constructed building within a reasonable time after erection as often as may be required by the Commissioner of Buildings. The tests must show that the construction will sustain a load with a factor of safety for floors and structural members as required by Section 136 of this Code, which is as follows:

"*Factors of Safety.*—Where the unit stress for any material is not prescribed in this code the relation of allowable unit stress to ultimate strength shall be—

"As one to four for metals, subjected to tension or transverse stress;

"As one to six for timber,

"And as one to ten for natural or artificial stones and brick or stone masonry.

"But wherever working stresses are prescribed in this code, varying the factors of safety hereinabove given, the said working stresses shall be used."

The report of the committee on sidewalks and floors was presented by George L. Stanley, chairman, of Ashtabula, O., and was adopted as amended and corrected by the committee.

The report of the committee on standard specifications for cement mortar blocks and concrete blocks, with a final amendment standardizing every form of block that will successfully pass all the prescribed tests, was adopted according to the recommendations of the committee through E. S. Larned, C. E., of Boston, chairman.

The report of the committee on resolutions was presented by Fred K. Irvine of Chicago, as chairman, in the absence of Robert W. Lesley.

Resolutions of thanks and appreciation were passed to J. N. Adam, Mayor of Buffalo; to the Chamber of Commerce, to the Board of Building Inspection, to the Automobile Club, to the University Club, and to the members of the Buffalo local committee. The press of the city of Buffalo and the technical press of the country were remembered, and resolutions to reimburse the officers for expenses incurred in association work as fast as funds become available were included.

After the fashion of a lecture, President Humphrey explained "The Progress in the Investigation of Cement Mortars and Concretes in the Structural Materials Testing Laboratories of the United States Geological Survey at St. Louis, Mo." This lecture was illustrated with a large number of stereopticon views, showing the methods employed, the testing apparatus and photographs of actual testing work in progress.

At the close of the lecture Mr. Humphrey was applauded, and a resolution was passed recommending to the next Congress to continue the appropriation of $100,000 per annum to support the work of the laboratories in order that it may be pursued to completion; and further, that each and every member see to it that his representative in Congress be requested to support such appropriation.

The convention then adjourned *sine die*.

THE ATTENDANCE.

The following is a list of members of the National Association of Cement Users in attendance up to 6 p. m. January 23, 1908, whose names were registered:

Richard L. Humphrey, 1001 Harrison Building, Philadelphia, Pa.
M. S. Daniels (The Kakiat Co.), Suffern, N. Y.
O. U. Miracle, R. O. Miracle (Miracle Pressed Stone Co.), Minneapolis.
H. C. Turner (Turner Construction Co.), 11 Broadway, New York City.
George C. Wright, 35 Grand Ave., Rochester, N. Y.
George L. Stanley, Ashtabula, O.
Mentor Wetzstein, George B. Palfer, Carl Gmiener (Ideal Concrete Machinery Co.), South Bend, Ind.
Charles D. Watson (Standard Building Construction Co.), 828 Fulton Bldg., Pittsburg.
E. S. Larned, 101 Milk St., Boston.
R. N. Cunningham (The International Firing Proof Co.), Columbus, O.
J. C. Beatty (California Artificial Stone Supply Co.), 902 So. Bldg., Los Angeles, Cal.
William J. Geuthiner (Simplex Manufacturing Co.), Despatch, N. Y.
William Ruprecht (Ruprecht Voirol Concrete Construction Co.), 8011 Broadway, S., St. Louis.
J. G. Joseph (Buffalo Steel Co.), 350 Linwood Ave., Buffalo.
George Wettlaufer (Wettlaufer Bros.), 490 Ellicott St., Buffalo.
Karl W. Lick (The Cement Block and Roofing Co.), Kenton, O.
W. M. Newton (W. M. Newton), Wyoming, Del.
D. C. Vining (P. B. Miles Manufacturing Co., Inc.), Jackson, Mich.
John E. Conzelman (Expanded Metal Corrugated Bar Co.), Frisco Bldg., St. Louis.
Frank Lewis, Harpersville, N. Y.
S. W. Curtis, C. H. Rose (Garden City Sand Co.), 188 E. Madison St., Chicago.
B. H. Rader, B. F. Affleck, Edgar M. Hager (Universal Portland Cement Co.), Chicago, Ill., and Pittsburg, Pa.
Benjamin Blethyn, 1803 Oregon Ave., Washington, D. C.
R. E. Spaulding (E. N. & R. E. Spaulding), Suffield, Conn.
J. F. Twamley (Coplay Cement Mfg. Co.), Philadelphia, Pa.
Albert Moyer (Vulcanite Portland Cement Co.), Flatiron Bldg., New York.
F. J. Moore (Saunders Portland Cement Co.), Chamber of Commerce, Chicago.
E. H. Defebaugh (ROCK PRODUCTS), 355 Dearborn St., Chicago.
Fred K. Irvine (ROCK PRODUCTS), 355 Dearborn St., Chicago.
Martin Kuhne (Truss Metal Lath Co.), 147 4th Ave., New York.
Phil. Koebring, Milwaukee, Wis.
C. P. Robinson, W. T. Mansfield, E. P. Evans, H. B. Green, H. F. Rauch, F. B. Geddes (Whitehall Portland Cement Co.), 1722 Land Title Bldg., Philadelphia.
P. Austin Tomes, E. D. Boyer, T. M. Magiff, W. A. Coles, C. A. Kimball (Atlas Portland Cement Co.), 30 Broad St., New York City.
Fred Fisher (Eureka Machine Co.), Lansing, Mich.
F. W. Howard, 19 Mulberry St., Hartford, Conn.
S. E. Gilbert, W. E. Dunn, Chicago, Ill. (Ray Manufacturing Co.), 1627 Columbus Ave., Philadelphia.
C. M. Runyan (The Runyan Concrete Machinery Co.), Canal Dover, O.
Frank C. Wight (Engineering News), 220 Broadway, New York.
A. L. Bender (Bender Manufacturing Co.), Topeka, Ind.
E. R. Kranich, 35 Newberry Bldg., Detroit.
W. B. Simmons (Hayden Automatic Block Machine Co.), Columbus, O.
John J. Turner, Builder, Amsterdam, N. Y.
Robert Mann Wood, Chicago; A. N. Porter, Joliet, Ill. (Thomas Cement Construction Co.).
W. H. Dunn (Dunn & Fourqurean), 211 E. Broad St., Richmond, Va.
Dana G. Chandler (Sylvania Concrete Co.), Sylvania, O.
Adolph Adams, Kendallville, Ind.
R. W. Holden (Rochester Composite Brick Co.), Rochester, N. Y.
J. S. Hodges (Hollow Wall Machine Co.), Fife Lake, Buffalo, N. Y.
J. W. Hartwick (Hartwick Machinery Co.), Jackson, Mich.
C. B. Wastren (The Knickerbocker Co.), Jackson, Mich.
R. G. Bush (Plainfield Cement Stone Co.), Plainfield, N. J.
Edwin C. Ide (Onondaga Pressed Stone Block Co.), Syracuse, N. Y.
D. C. Babcock, Springville, N. Y.
George D. Conger (Springville Concrete Co.), Springville, N. Y.
A. A. Pauly, M. Fleming, J. S. Jones (The Concrete Stone and Sand Co.), Youngstown, O.
L. V. Thayer (Peerless Brick Machine Co.), Minneapolis.
David B. Ledlie, Saratoga Springs, N. Y.
George W. Winship, Saratoga Springs, N. Y.
W. W. Schouler (Standard Paving Co.), Newark, N. J.
Arthur J. Maynard, State Farm, Mass.
F. A. Kershaw (Kent Machine Co.), Kent, O.
George J. Hamill (Victory Concrete Construction Co.), Bayside, L. I., N. Y.
Sam. Lentwiler (Stocker Gravel Co.), Highland, Ill.
M. Burrell, W. C. Burrell (Burrell Mfg. Co.), Bradley, Ill.
F. H. Mattiage (Art Concrete and Construction Co.), 417 Fresh Pond Road, Evergreen Borough, Queens.
Armstrong Concrete Specialty Co., 191 Devonshire St., Boston.
G. F. Lillie, Tekamah, Neb.
J. W. Hayes, South Framingham, Mass.
J. S. Rightmeyer, Auburn, N. Y.
C. J. Welch (Welch & Howley), Urbana, Ill.
G. W. Kramer, W. H. Jassen, F. O. Kramer, J. L. Shannon, Waterloo, Ia. (Kramer Automatic Tamper Co.), 107 Franklin St., Peoria, Ill.
H. W. Remington (Hayden Automatic Block Machinery Co.), 19 South St., New York City.
I. W. B. Smalley, Plainfield, N. J.
D. M. Collier, 52 Brighton St., Rochester, N. Y.
Thomas H. Nie, Lyndonville, N. Y.
John McNary, Canonsburg, Pa.
W. Porth, Jr. (Louis Auer & Son), Milwaukee, Wis.
Samuel Munnel, Canonsburg, Pa.
S. P. Angle (Angle Construction Co.), Hagerstown, Md.
M. M. Lutz (West Park Block Co.), West Park, O.
Adam Saal (Saal & Brooking), Pekin, Ill.
John Svenson, 602 Bessemer Bldg., Pittsburg.
H. L. Cook, Front Royal, Va.
W. L. Dow, W. A. Dow, E. W. Dow, M. K. Sawyer, J. T. Summers (Perfection Block Machine Co.), Minneapolis, Minn.
J. E. Dennis (Buffalo Litholite Co.), 3 Jersey St., Buffalo, N. Y.
C. W. Cadwell (Cadwell Silica Stone Co.), Windsor, Ont.
Holden E. and James Brock (Brock Bros. Manufacturing Co.), St. Louis.
August Radtke, Frank P. Walter (The Radtke-Walter Co.), Monroe, Mich.
Frank J. Phelan (N. Y. Concrete Block Co.), 17 Battery Place, New York City.
Geo. C. Walters (The Concrete Age), Atlanta, Ga.
Chas. Mankedick (Sullivan Cement Works), Sullivan, Ind.
Wm. H. Stone (Manufacturer's Record), Baltimore, Md.
C. J. Helm (Queen City Brick Machinery Co.), Traverse City, Mich.
W. N. Jones, 223 Marion St., Corry, Pa.
Wm. Clark, 157 Branch Nart Ave., Long Branch, N. J.
B. Schubert, 155-159 Jamaica Ave., Brooklyn, N. Y.
W. H. Ham, E. N. Hunting (General Fireproofing Co.), Youngstown, Ohio.
R. M. Balyeat (Balyeat Coal & Cement Co.), Van Wert, Ohio.
H. M. Kelly (Superior Cement Roofing Co.), Bryan, Ohio.
E. P. Healey (Glencoe Lime & Cement Co.), St. Louis.
C. R. Knapp (C. R. Knapp & Co.), Builders Exchange, Philadelphia.
Chas. Shuman (Gibsonburg Coal & Ice Co.), Gibsonburg, Ohio.
W. O. Williams (Clover Leaf Machine Co.), South Bend, Ind.
Geo. M. Whitcomb, Desplaines, Ill.
W. L. Wiselogel (Wiselogel & Co.), Muskegon, Mich.
J. U. C. McDaniel (Chicago Portland Cement Co.), 108 La Salle St., Chicago, Ill.
C. B. McVay (Western Portland Cement Co.), Yankton, S. D.
E. P. Goodrich (Engineering Record), 1170 Broadway, New York City.
Jacob B. Blau (Blau Collapsible Steel Center Co.), Pittsburg.
J. L. Long (Long & Mickler), Allentown, Pa.
Theodore H. Skinner (Oneida Community Co.), Oneida, N. Y.
S. G. K. Stradley (Penn-Allen Portland Cement Co.), Allentown, Pa.
D. M. Click (South Omaha Artificial Stone Co.), South Omaha, Neb.
P. J. Humphreys (East Liberty Cement Roofing Co.), East Liberty, Ohio.
Eugene J. Minnaman, Pittsford, N. Y.
Ira Beyer, Mishicot, Wis.
Edward Hays (Bellefonte Lumber Co.), Bellefonte, Pa.
W. E. Dyer (Wiselogel & Co.), Muskegon, Mich.
S. C. Kelly (The Butler Wood Fibre Plaster Co.), Butler, Pa.
A. W. Thorn, E. W. Coles, C. T. O'Neill, E. C. Shimer (Lehigh Portland Cement Co.), Allentown, Pa.
W. S. Rosencrans (I. Rosencrans & Sons), Walden, N. Y.
E. Meyer (Edison Portland Cement Co.), 1133 Broadway, New York City.
Isiah Rosencrans, Walden, N. Y.
Alex. C. Birline, Ludlow, Mass.
H. S. Doyle (American Steel & Wire Co.), Chicago, Ill.
John Fallins, Supt. (Edward Roche), Far Rockaway, N. Y.
Ira Williams (Iowa Association Cement Users), Ames, Iowa.
F. S. Townsend, Sycamore, Ill.
Chas. M. Potter, Naugatuck, Conn.
Edmond J. Young (Young & Jenks Co.), Waterbury, Conn.
W. W. Ballantine, F. R. Richelhaupt (George Rackle & Sons), 4514 Superior Ave., Cleveland, Ohio.
J. Robert Gill (Hydraulic Stone Co.), Houston, Texas.
W. E. Patch, Rutland, Vt.
A. T. Morgan, 204 Dale Ave., Grand Rapids, Mich.
A. W. Morgan (Chas. A. Kimm), 204 Dale Ave., Grand Rapids, Mich.
Palmer Cummings (The Cummings Cement Co.), Akron, Ohio.
W. G. Elliott (Edmondson Concrete Machinery Co.), South Bend, Ind.
Isaac F. West (Cement Stone & Supply Co.), Wichita, Kan.
I. J. Lemon, Findlay, Ohio.
T. F. Linday, Erie, Pa.
Franklan J. Mason, 126 Macon St., Brooklyn, N. Y.
Alfred W. Thorn (Thorn Cement Co.), 28 W. Seneca St., Buffalo, N. Y.
J. J. Murray (J. J. Murray & Co.), Cayuga, Ont., Can.
J. S. Reiff (Lykens Concrete Block Mfg. Co.), Lykens, Pa.
C. B. Hastings (Johnson & Hastings), 150 Jefferson St., Brookville, Pa.
A. A. Souder (F. H. Souder & Son), Lansdale, Pa.

Oliver Rosenberger, Lansdale, Pa.
L. B. Williams, Coon Rapids, Iowa.
A. J. Cromar, Brantford, Ont.
A. J. Zemmer (Zemmer Cement Plant), Port Huron, Mich.
A. W. Cadogan, No. 8 Ada Place, Buffalo, N. Y.
P. P. Comoll (Corn Palace Cement Works), Sioux City, Iowa.
E. S. Walton (The Youngstown Ice Co.), Youngstown, Ohio.
Frederick C. Stady (Springville Concrete Co.), Springville, N. Y.
Frank S. Keith (Canadian Manufacturers), 408 McKenna Building, Toronto, Ont.
C. J. Case, Troy, Pa.
E. S. Hampton, Orchard Park, N. Y.
A. S. Johnson, Freeport, N. Y.
George Gadon, Phillipsburg, N. J.
Thomas J. Hind, 19 Milk St., Boston, Mass.
William Tillmann (Jeannette Concrete Construction Co.), Jeannette, Pa.
George W. Stone (Concrete Construction Co.), 236 Day Building, Worcester, Mass.
L. R. L. Brown, St. Marys, Ont., Can.
Carl A. Haswin (Seaborn Cement Stone Co.), Holly Beach, N. J.
James W. Boyle, Freeland, Pa.
John A. Liffler (Oliver Liefensfer Bros.), Hazelton, Pa.
R. W. Russell (The Cleveland Concrete Building Block Co.), 1010 Rockefeller Building, Cleveland, Ohio.
John R. Minnick, Longport, N. J.
J. N. Stohl, 108 Thompson St., Latrobe, Pa.
E. W. Harrold, Derry, Westmoreland Co., Pa.
D. H. Jansen (Jansen Zoeller), Pekin, Ill.
J. P. Schmitt (Schmitt Construction Co.), Peoria, Ill.
H. R. Beebe (Beebe & Beebe), 15 Mann Building, Utica, N. Y.
James E. Payne (Payne Cement Co.), Mansfield, Ohio.
Frederick E. Wyatt (F. E. Wyatt Concrete Block Co.), 3 Avondale Park, Rochester, N. Y.
R. T. Hamilton (John P. Minnick & Co.), Longport, N. J.
W. E. Good, Ashtabula, Ohio.
Riley Johnson, Ashtabula, Ohio.
Fred Wilcox (The Wilcox Co.), 38 Northampton Ave., Buffalo, N. Y.
Arthur N. Pierson, 1 Park Row, New York City.
J. E. Shelhart (The Ewing Concrete Machinery Co.), Akron, Ohio.
Robert W. Lesly (American Cement Co.), Philadelphia, Pa.
B. F. Hitchcock (F. E. Wyatt Concrete Block Co.), 17 Avondale Park, Buffalo, N. Y.
John Glass (Manufacturer's Record), Chicago, Ill.
M. C. Robinson, Ashtabula, Ohio.
W. H. Stockton, Ashtabula, Ohio.
P. T. Longacher (P. T. Longacher & Co.), Elkhart, Ind.
Gustave E. Kahn (Sterling Engineering & Construction Co.), Caswell Block, Milwaukee, Wis.
E. H. Christopher (Jeffer & Christopher), 282 Prospect St., Bridgewood, N. J.
H. M. Young (H. M. Young & Son), Eaton, Ohio.
L. A. Austin, Secretary (Pennsylvania Concrete Co.), 4952 Robinson Ave., Philadelphia, Pa.
J. D. Carey (The Carey Construction Co.), Cleveland, Ohio.
Charles H. Issel, 685 E. 105th St., Cleveland, Ohio.
I. W. Farquhar (Farquhar Realty Co.), 449 E. 13th St., Brooklyn, N. Y.
J. W. Wigton (Cement Machinery Supply Co.), Denver, Colo.
B., R. & P. Ry., East Salamanca, N. Y.
F. M. Emerson (Emerson & Norris Co.), Boston, Mass.
E. L. Powers, H. L. Powell (Good Roads Magazine), 150 Nassau St., New York City.
Leonard C. Wason (Aberthaw Construction Co.), 8 Beacon St., Boston, Mass.
J. W. Pierson (New Jersey Cement Stone Co.), 89 Dodd St., East Orange, N. J.
Dawson Teets (Multiple Concrete Machine Co.), 744 Ohio Building, Toledo, Ohio.
M. E. Warner (E. Warner & Son), Marion, N. Y.
Lin Beham (Youngstown Art Stone Co.), Youngstown, Ohio.
P. O. Munson, Galesburg, Ill.
Robt. C. Morris (Central Concrete Construction Co.), Louisville, Ky.
J. R. Zeisn (Zeisn Brothers), Berwick, Pa.
E. L. Hatfield (Cement World), Chicago, Ill.
Joseph M. Hill (Hill & Van Wagner), 403 Kirk Building, Syracuse, N. Y.
Jason N. Damick (Norwood Cement Stone Construction Co.), Norwood, Mass.
C. W. Boynton, Wm. M. Kinney (Universal Portland Cement Co., Inspection Bureau), Chicago, Ill.
Fred. K. Fields (Standard Concrete Co.), Altoona, Pa.
Eugene E. Person (Ricketson Mineral Paint Co.), Milwaukee, Wis.
H. L. Parker (Farqubarson Realty Co.), 807 Beverly Road, Flatbush, N. Y.
H. B. Hecock (The Elyria Stone & Coal Co.), Elyria, Ohio.
A. E. Worner (Technical Publishing Co.), Cleveland, Ohio.
L. Pettyjohn (Pettyjohn Company), Terra Haute, Ind.
Robert F. Havlik (Ideal Concrete Machinery Co.), South Bend, Ind.
Joseph Patterson, St. Marys, Ont., Can.
George F. Fisher (Hydraulic Concrete Manufacturing Co.), North Tonawanda, N. Y.
E. V. N. Heermance (Virginia Concrete & Engineering Co.), Rocky Mount, Va.
C. A. Lingham (Canadian Portland Cement Co.), 502 Temple Building, Toronto, Can.
I. S. Molbrook (Engineering Record), 239 W. 39th St., New York City.
James P. Hall, Inc., Jersey City, N. J.
C. R. Calloghan (Bellevue Stone Co.), Bellevue, Ohio.
George Smith, Johnston Ave., Kearney, N. J.
Adolph Schilling (Stone Steel Company), Albany, N. Y.
W. L. Caldwell (Berger Manufacturing Co.), Canton, Ohio.
W. A. Sunsford, Madisonville, Ky.
Ara E. Richardson (Saginaw Concrete Stone Co.), Saginaw, Mich.
Emil G. Perrot, S. W. Cor. 12th and Chestnut Sts., Philadelphia, Pa.
Walter F. Ballington (Ballington & Ferrot), S. W. Cor. 12th and Chestnut Sts., Philadelphia, Pa.
N. P. Winchell (Simpson Bros., Corporation), 166 Devonshire St., Boston, Mass.
R. Z. Snell, Adam Hunsberger (R. Z. Snell Manufacturing Co., South Bend, Ind.
John P. Schuyle, Medina, N. Y.
F. S. Phipps (Hutchinson Concrete Co.), Hutchinson, Kan.
T. A. Chadburn (Standard Cement Brick Block Co.), 242 St. James St., Montreal, Que., Can.

NOTES OF THE BIG CONVENTION.

G. F. Lillie of Pekamah, Nevada, claimed to have made the longest ride of any delegate.

E. L. Walton of Youngstown, Ohio, leading dealer in cement and every other building material, was with us for a day.

The tall form and genial countenance of E. S. Larned of Boston showed up early. He was loaded with "Standard Specifications."

William Ruprecht, a prominent general contractor of St. Louis, attended the show and gathered knowledge concerning the merits of various displays.

Adam Saal of Pekin, Ill., took the usual lively interest in the convention. He is a heavy contractor of long experience and now specializes in concrete.

Charley Camm, who says pleasant things as the representative of the American Portland Cement Company to all the visitors, never missed an opportunity.

Charles J. Welch of Urbana, Ill., was one of the earliest cement users on the field. He makes good blocks as well as a very complete line of other concrete materials.

E. E. Melick, No. 1420 Chestnut Street, Philadelphia, largest fire-brick distributor in the United States and Canada, visited the convention and was very much delighted.

I. F. West of Wichita, the leading concrete contractor in Southeastern Kansas, was on hand examining the principal machinery exhibits with a view to putting in improvements.

I. Rolfe of the Rolfe Building Material Company of New Brunswick, N. J., came in to see the show. He reports a better feeling in his locality and looks for an early resumption of business.

Edward J. Norris, vice president of the American Stone and Conduit Company, Terre Haute, Ind., attended the show and gleaned what information he could in the interests of his concern.

W. W. Schouler of the Standard Paving Company, Newark, N. J., is a standard paving man of the type that knows all kinds but picks out only the best kind for his own efforts.

W. W. Bale of the Pennsylvania Portland Cement Company carried a cricket souvenir about with him that made you think there was a whole battery of telegrams going over the wires.

Kennedy Stinson of Montreal, Canada, managing director of the Stinson-Reeb Builders' Supply Company, Ltd., was a visitor at the show. He expressed himself as highly pleased with the exhibit.

Purvis E. Ritchie of Quebec, representing F. H. Hopkins & Co., and the Eadie-Douglas Company of Montreal, was another of the Canadians present who were enjoying the interesting exhibition.

W. A. Phillips, manager of the American Stone and Conduit Company, Terre Haute, Ind., was a visitor at the show. He absorbed items of interest that will be of benefit to him in his business.

The Fred C. Hohn Power-Tamped Concrete Brick Machine was represented at the convention by A. J. Ralph, of A. J. Ralph & Co., of Indianapolis, who are the general sales agents for the United States.

John A. Reeb of Port Colborne, Ont., representing the Welland County Lime Works Company, came over to see the show and incidentally to visit his brother, M. A. Reeb, the well-known builders' supply man of Buffalo.

Robert C. Morris, president of the Central Concrete Construction Company, Louisville, Ky., headed the Kentucky delegation. He is an energetic concrete man who is a stickler for quality, which is the explanation of his success.

Among the interested visitors was Thomas H. Nie of Lyndonville, N. Y., who reports considerable interest in concrete work in his locality. He says his past season has been exceptionally good and that the outlook is fine.

George M. Whitcomb, the well-known manufacturer of concrete building blocks and dealer in builders' materials, was at the show. He says that business with him has been very good and that the prospects for a big spring trade are bright.

Robert W. Leslie, president of the American Portland Cement Company, Philadelphia, Pa., had a big bunch of engagements waiting for him on arrival. He made good on all of them, too, although it kept him busy every minute of his stay.

Gustave Kahn, engineer and manager of the Sterling Engineer and Construction Company, Milwaukee Wis., was on hand and taking in the sights of the exposition. He found many points of interest and is always looking for more information.

Ross F. Tucker, New York City, president of the Concrete Association of America, was on hand at the show and made his headquarters, temporarily, with the American System of Reinforcing. Mr. Tucker is a member of the firm of Tucker & Vinton, contractors, New York City.

Edward M. Mancourt of Detroit, Mich., is the man who sells the famous "Fairmont" coal to the cement manufacturers. He was not doing a thing but offering bargains in cement coal and finding takers quick and fast. He seems to be all undismayed about deliveries, no matter how big the figures are.

Sam J. Vail of Detroit, Mich., one of the founders of the National Cement Users' Association, took in the big exposition, and put red Whitehall buttons on everybody just the same as usual. He is now a dealer in builders' supplies under the firm name of Samuel J. Vail & Co., but still in the convention harness. It fits.

Albert Moyer, whose suave manner and glad hand are always in evidence, was unstinted in his praise of the exhibition. Mr. Moyer is well known as the author of several standard works on the subject of concrete construction, and is the general sales manager of the Vulcanite Portland Cement Company.

R. W. Holden, secretary and treasurer, and P. J. Harkins, the salesman, of the Composite Brick Company, Rochester, spent some time at the exhibition. Both say that ROCK PRODUCTS is the most interesting of all the trade journals, and that each copy is patiently awaited with great interest. They report a good business.

A. G. McComb, engineer and general contractor, Olean, N. Y., one of the earliest advocates of concrete construction, took in every phase of the convention as an interested visitor. The number of barrels of cement that he has specified and consumed in works that he has directed amounts to so many millions that he has lost count.

William H. Faxon, Buffalo merchant, is quoted as having made the following statement: "We want to build a four-story building on the Terrace in this city, but the building ordinances restrict buildings of concrete to a certain height. I believe there are many others who would go into reinforced concrete construction if the ordinances were not so restricted."

Edward M. Hager, president of the Universal Portland Cement Company, was there congratulating the officers and nodding at the exhibitors. He appreciates the splendid exhibit feature and besides took a peep in upon the convention hall. Whenever there is something big in cement doing he is always sure to be on hand in person as well as by means of his extensive organization.

C. A. Monks, Louisville, Ky., who has won a great reputation in recent years in the line of reinforced concrete in the South, was the first man to greet ROCK PRODUCTS on our arrival at the convention building. He did a big business last year. He winks the other eye when you ask him how things look to him and says: "Well, there are some grapes, and we know how to pluck them."

THE SMOKER.

The reception and smoker which was given on the night of Thursday, the 23d, was a most enjoyable occasion. Swallowtails were numerous but not *en regle*, but every face wore a smile, and all who attended seemed to be devout adherents of the new gospel of optimism. "Keep smilin' and love everybody" was the motto: The Buffalo local committee, composed of prominent citizens interested in the development of concrete, covered themselves with glory as princely entertainers, and not a little of this glory will remain forever with the committee's able chairman, A. W. Thorn, the genial and whole-souled representative of the Lehigh Portland Cement Company, who won the hearts of all with his brilliant yet cordial impromptu speech of welcome.

The smoker committee consisted of J. M. Carter and M. G. Farmer, and the local reception committee were Frank M. Farrar, F. L. Lane and M. A. Reeb, who made every guest feel as if he owned the whole town. Ben. F. Clark's orchestra dispensed music continuously, and the Concert Hall had been provided with little round tables. There was chicken galore, salad, cold meats of a dozen different kinds, and turkey sandwiches till you couldn't rest. Grapes and oranges were there just the same as if it had been in Florida, and nobody thought of the driving blizzard outside. There was no attention paid to the flight of time. At least 300 visitors participated and the number of good cigars they smoked has not yet been told. The good cigars and the good things to eat were not the only good things either. The good stories would fill a book; the good songs would make a dozen concerts, and the general air of *bonne camaraderie* crowned it all with happy radiance. It was informal in that each visitor felt free to do just as he pleased, and every one was happy.

EXHIBITS AND EXHIBITORS.

The American Cement Company, Philadelphia, showed samples of material used in the manufacture of Giant Portland and natural cements, also the finished product, and a large display of photographs taken of work where these cements were used exclusively. They also exhibited building blocks and briquettes made of Giant Portland and two brick columns pointed up with this brand of cement. The booth was in charge of C. M. Camm, assisted by C. F. Peters and J. L. Seligman.

The American System of Reinforcing, Chicago, showed a complete system of their reinforcing, including spiral column reinforcement, wire fabric and rods for slabs, rods and stumps for beams; also monolithic composition flooring used on top of concrete or wood. The booth was in charge of Arthur A. Clement, assisted by Franz Djorup.

The Anchor Concrete Stone Company of Rock Rapids, Iowa, exhibited cement block machines, chimney block machine and porch column machines, and demonstrated the actual size of blocks and method of ties in a specimen wall. The booth was in charge of Charles W. Bradley, assisted by I. D. Riniker.

The American Steel and Wire Company, Chicago, exhibited woven-wire reinforcement for floor slabs, columns, beams, telephone poles and fence posts; also reinforcements in rolls and sheets, triangular mesh. The booth was in charge of H. S. Doyle, assisted by Messrs. Jennings and Greenburg of the Buffalo office and Mr. Pratt of the New York office.

The Ashland Steel Range and Manufacturing Company, Ashland, Ohio, showed a U. S. Standard cement block machine complete, with all pieces, parts and attachments. This machine was used in demonstrating various features of work. They also exhibited the nickel-plated U. S. Standard block machine and a complete U. S. Standard cement mixer, mounted with gasoline engine on four-wheel truck. The booth was in charge of U. S. Shelly, assisted by A. J. Bentz, Charles Tunkey and attendants.

The Aquabar Company of Philadelphia and New York had a practical demonstration of "the waterproofing that waterproofs." Aquabar is a solution mixed with water with which cement is tempered. Robert W. Maust was in charge.

Louis Auer & Son, Milwaukee, demonstrated their method of wall construction. The booth was in charge of W. Porth, assisted by August Reichert.

The Association of American Portland Cement Manufacturers, Land Title Building, Philadelphia, had on exhibition the plans submitted in their contest decided last fall. They were well worth seeing, consisting of plans of modern house construction by the use of concrete. Percy H. Wilson and C. Earle E. Bottomley had charge.

H. H. Armstrong, Rochester, N. Y., exhibited the Little Giant brick machine in actual work, demonstrating the ease of operation.

The Atlas Portland Cement Company, New York, showed specimens of material in both raw and manufactured state, also colored briquettes and art work made of the Atlas brand cement. They passed out some interesting literature in the form of "Concrete Construction about the Home and on the Farm," "Reinforced Concrete in Factory Construction" and "Concrete Cottages." The booth was in charge of P. Austin Tomes, assisted by W. A. Coles, E. D. Boyer, T. M. Magiff and C. A. Kimball.

The Ballou Manufacturing Company, Belding, Mich., showed a hand-power Little Giant mixer, a power Little Giant mixer and a power Giant three-hopper mixer, with a 200-yard capacity in ten hours. B. B. Swarthout had charge, assisted by J. B. Brown.

The Barrett Manufacturing Company, New York, exhibited detail drawings showing Barrett specification roofing, waterproofing and sub-floors as applied to concrete. The exhibition was in charge of L. P. Sibley and William S. Babcock.

The Berkshire White Portland Cement Company exhibit was built, designed and executed by Hammerstein & Denivelle of New York, except a few pieces which were made by the New York Architectural Terra Cotta Company. The fountain and vase were very much admired and are excellent examples of the architectural possibilities of white Portland cement. The balance of the exhibit consisted of photographs of buildings in which their cement was used. William L. Moffat, the president of the company, was in charge, assisted by J. O. Averill, the secretary, and Albert Denivelle, who superintended the construction of the exhibit.

The Besser Manufacturing Company of Alpena, Mich., had at their booth brick and block machines and tile molds; also an automatic tamper. The exhibit was in charge of J. H. Besser, assisted by Ben Cole.

One of the most attractive displays, as well as one of the most costly, was that of the Blanc Stainless Portland Cement Company of Allentown, Pa., whose exhibit was in charge of Charles H. Kloman. The two columns supporting the arch over the entrance weigh 1,600 pounds each. They were made by Neumann & Even, sculptors and plasterers at 329 East Forty-seventh Street, New York.

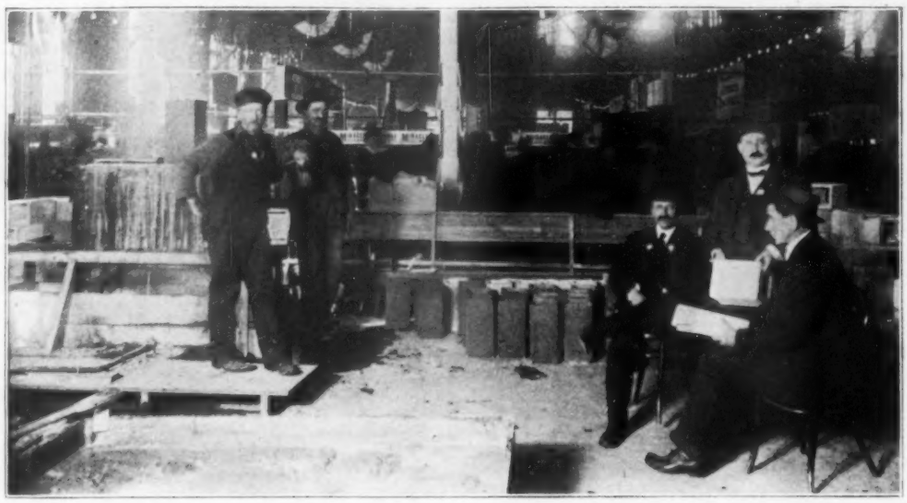
Ballou's White Sand Company exhibited a fine quality of washed sand for facing purposes. This concern has its quarries at Millington, Ill., and they mine two grades of this product. It is especially valuable for fine facing and presents a beautiful appearance, being almost snow white. The booth was in charge of E. J. F. Ballou.

The Blaw Collapsible Steel Centering Company of Pittsburg, Pa., showed their various centers for concrete conduit work. The exhibit was in charge of James B. Blaw.

The Buffalo Litholite Company showed a beautiful specimen of manufactured stone for all purposes in the building line, but especially attractive in ornamental designs for trimmings and ordinary wall work. The booth was presided over by J. D. Dennis.

The Buffalo Steel Company, Tonawanda, N. Y., exhibited high tensile steel for reinforcing concrete. The booth was in charge of J. E. Joseph, assisted by W. J. Kibler and P. I. Large.

The Burrell Manufacturing Company, Bradley, Ill., showed the X-L-All product, which included block machines in actual operation, brick machinery, batch mixers, column molds, conveying and elevating machinery. The booth was presided over by W. C. Burrell, assisted by R. W. Burrell and a force of demonstrators and salesmen.



TYPICAL EXHIBITS: 1. FIREPROOF STRUCTURAL TILE MADE WHILE YOU WAIT.

The Cement Machinery Company of Jackson, Mich., exhibited their line of brick and block machines. In connection with this they showed the Advance mixer at another hall. Sid L. Wiltse was in charge.

Demonstrations of "how to make cement tile every minute" was the slogan in force at the Cement Tile and Machinery Company's booth. A large force of men, under the personal direction of J. H. Stewart, assisted by J. F. Pfliffner, turned them out by actual operation in almost countless numbers.

The Century Cement Machine Company, Rochester, N. Y., exhibited various sizes, styles and designs of concrete blocks made by the Hercules machines. They also showed a Hercules concrete block machine in actual operation; Century brick machine; ornamental stone columns, balustrades, etc. Another feature of this exhibit was a Hercules concrete mixer. The booth was in charge of A. T. Bradley, assisted by H. R. Morton, S. Finley, O. D. Tiffany and Robert Seibert.

The Chase Foundry and Manufacturing Company, Columbus, Ohio, displayed a complete line of concrete block cars, brick cars, dump cars, combination dumping cars and dumping buckets, transfer cars, switches and turntables. The booth was in charge of S. M. Chase, assisted by W. C. Stocklin.

The Clover Leaf Machine Company, South Bend., Ind., exhibited a No. 8 Clover Leaf mixer, mounted on trucks, and a 5-horsepower Ideal gasoline motor; also a No. 5 mixer, mounted on trucks, with a 2½-horsepower New Way air-cooled gasoline motor. W. O. Williams had charge of the booths, assisted by Clarence Moore.

The Concrete Stone and Sand Company, Youngstown, O., had an extensive exhibit of the already famous fireproof structural tile which attracted so much attention at the Chicago show last month. A. A. Pauly, the inventor, assisted by M. Fleming and P. F. Jones, demonstrated the process of manufacture by making actual tile, using cement, sand and slag, with steam connections.

The Concrete Spade Company, Chicago, showed a variety of styles of concrete spades of their make and demonstrated their uses. The booth was in charge of C. C. Butler, assisted by O. H. Buck and George W. Tarkworthy.

The California Artificial Stone Supply Company of Los Angeles, Cal., and the Canadian Concrete Machinery Company, Ltd., of Toronto, Ont., combined their exhibits. James C. Beatty, the president of both companies, had charge, assisted by R. G. Rittenhouse, the manager. The exhibit consisted of the California cement stone machine, demonstrating the California system of making ornamental work and rock-faced ashlar, and the London brick machine.

The exhibit of the Dietrichs concrete wall form clamp was alike interesting and instructive. By the use of these clamps timbers can be used over and over again, thus eliminating quite a considerable item in the first cost of construction. It is not only simple, but inexpensive. Charles Dietrichs, the inventor (Little Falls, N. J.), had charge of the display, which consisted of a completed section of monolithic wall constructed with the use of these clamps.

The Dyer Molding Machine Company, Chicago, exhibited the Dyer 3-horsepower molding machine. It turns out any sized block from 8 to 32 inches long, from 8 to 18 inches wide, does the mixing and pressing, and delivers to an endless chain, which is all done in one operation. The exhibit was in charge of W. E. Dyer.

The Eureka Machine Company, Lansing, Mich., showed a Eureka mixer equipped with steam engine and boiler, two Eureka mixers fitted with "New Way" gasoline outfit, one hand-power mixer; also parts of working model of feeders, etc. The exhibit was in charge of Fred. Fisher, assisted by George A. Cooley, James J. Cox, H. Cramer and W. V. Johnson.

The Edison Portland Cement Company, New York, showed samples of raw material in various forms, also the finished product. Their booth was neatly decorated with labels and banners bearing the Edison name, large, attractive calendars, and sample cement bricks. A beautiful placque Indian head was also exhibited. This was of a three-to-one mixture and a beautiful specimen of work. The exhibition was in charge of M. M. Hunter, assisted by J. L. Bernard, John Howlings, E. Meyer, sales manager, and W. H. Mason, superintendent of mill.

Eastlack & Souder, Swedesboro, N. J., were represented by both members of the firm. They make the kind of blocks that win.

The familiar figure of W. G. Elliott of the Edmondson Concrete Machinery Company, South Bend, Ind., was on the firing line. He was busy pointing out a few features of the Edmondson block.

The stereopticon show of the Expanded Metal and Corrugated Bar Company, St. Louis, lighted up many facts about steel rods and bars and the actual value they play in building. John Conzelman had charge.

The J. B. Foote Foundry Company, Fredericktown, Ohio, exhibited two block machine outfits; also a brick machine. The booth was in charge of James B. Foote, assisted by Jay B. Foote and an able force.

The Fisher Hydraulic Stone and Machine Company, Baltimore, Md., showed sample stone and wall construction. These people are engaged in actual work in a nearby town and has created considerable interest in the work as it rises from one stage to the next. The booth was in charge of John P. Bullington, general manager, assisted by W. H. Fisher, president, and W. T. Hayward, secretary.

The exhibit of the Foote Manufacturing Company, Nunda, N. Y., consisted of a No. 3 Foote continuous mixer, steam-driven; a No. 2 Foote continuous mixer, gasoline-driven; a No. 6 Foote batch mixer, steam-driven; an 8-horsepower steam single-drum hoisting engine. The demonstration was by the W. H. Wilcox Company, sales agents, Binghamton, N. Y.

The Francisco Block Machine Company, Columbus, Ohio, had in operation the Francisco adjustable concrete block machine, using coarse wet concrete.

The Fillmore Machinery Company, Fillmore, N. Y., showed in actual operation a No. 2 Fillmore continuous proportioning mixer. The presiding officer was A. G. McEarnaghan, assisted by W. H. Jeffs and George Pitcher.

The Garden City Sand Company, Chicago, showed instructive examples of different kinds of lathing and plastered exteriors by the use of "Stonekote"; also a brand-new material, "Waterproofed Cement." S. W. Curtis and C. H. Rose were delighted to explain all about it, and they had the goods as well as plenty of photographs to convince the most skeptical.

The exhibit of the General Fireproofing Company, Youngstown, Ohio, included trussits for roof construction; miniature forms for beams and girder reinforcement, with model pin-connected girder frames erected in them; a large rack of cold-twisted lug bars, graduated in sizes; herringbone expanded steel lath; samples of Universal steel corner bead, and other lathing materials. The display was in charge of W. H. Hamm, chief concrete engineer, assisted by E. N. Hunting, H. B. McMasters, secretary, D. D. Donahue and M. E. Murray.

The Hayden Automatic Machine Company, Columbus, Ohio, showed in actual operation a Hayden down-face automatic block machine, also Hayden improved mixers. W. B. Simpler was in charge, assisted by George Friel.

One of the new propositions on exhibition was the Hickson's sewer mold system for building in place conduits and sewers of all descriptions. They use a collapsible metal form and also a shifting member for laying the concrete. It is a new invention and is certainly a lead in the right direction, for even small municipalities can by this method have a first-class drainage system at little cost. It is one of the practical things in concrete that is sure to be a winner. Joseph Hickson, the inventor, and Thad E. Buck demonstrated, and they did a rushing business.

One of the most unique exhibits was that of the A. C. Horn Company, 8 Burling Slip, New York, which was in charge of A. C. Horn, assisted by August Vogel and J. H. Knapp. It consisted of a concrete wall in panels—two of the panels waterproofed and one made permeable. The entire wall was subjected to a continuous rainfall, showing how absorbent concrete is without waterproofing, and the efficacy of concrete with waterproofing.

The Hydraulic Concrete Machine Company of Buffalo, N. Y., showed their hydraulic block machine. This was demonstrated by W. W. Wade, E. H. Hubman and G. F. Fisher.

The International Brick Machine Company of Binghamton, N. Y., showed a brick machine having a capacity of 17,000 brick per day. This machine makes brick from dry sand and cement, the moisture being given after the initial set. The exhibit was in charge of William F. Donley, assisted by O. G. Drefendorf and John Scott.

The Hartwick Machinery Company of Jackson, Mich., had their continuous proportioning mixer on exhibition.

in charge of J. W. Hartwick, assisted by A. B. Kelley.

The large traction and continuous mixer shown by the Iroquois Iron Works attracted much attention among large contractors.

The International Fence and Fireproofing Company, Columbus, Ohio, exhibited an American mixer, a mixer model and samples of steel wire fabric and cables. The booth was in charge of R. N. Cunningham, assisted by J. R. Thomas.

The Ideal Concrete Machinery Company, South Bend, Ind., exhibited their complete line. Block machines, batch mixers and other cement-forming machinery were shown in actual demonstrations; also molds of every description and almost every use. A large assortment of block faces attracted much attention. The booth was in charge of Carl Gmiener, superintendent, assisted by George Ayrault. Chris. Schnurr was the demonstrator. Others of the selling force were M. Wetzstein, president; George B. Pulfer, general manager; J. Augustine Smith, secretary; H. E. Havelik, engineer, all of South Bend; also C. F. Wampler, Dayton, Ohio; N. E. Kennedy, Boston, Mass.; N. W. Edgar, Detroit, Mich.; E. B. Gregory, New York; J. L. McGill, New York; F. M. Leach, Detroit; C. F. Pulfer, secretary Canadian Company; George Fink, superintendent Canadian Company, London, Canada; Mr. Chadwick, Montreal.

The Jackson Company of Akron, N. Y., demonstrated reinforced concrete made by using boards covered with 28-gauge expanded metal lath. This exhibit was in charge of F. M. Jackson, assisted by H. L. Avery and H. L. Staner.

George B. Johonnat of Buffalo, N. Y., demonstrated a tag-addressing machine for fast and accurate addressing of tags; also a Smith computing table for computing wages and piece work.

The only power post machine was exhibited by the Kerlin Automatic Post Machine Company of Delphi, Ind. They made reinforced concrete posts at a very rapid rate before an interested throng. W. G. Kerlin, the inventor, E. W. Bowen and Wm. N. May explained the machine and also the angle reinforcing.

The Knickerbocker Company, Jackson, Mich., exhibit consisted of a No. 6 Coltrin concrete mixer mounted on trucks and equipped with a 1¼-horsepower Ideal gasoline motor. The exhibit was in charge of W. B. Knickerbocker, assisted by C. B. Westren and George C. Schaffer.

The Koehring Machine Company, Milwaukee, had on exhibition a big Koehring mixer which was run at full tilt during the convention. Ph. A. Koehring was the demonstrator.

F. A. Kershaw of the Kent Machine Company, Kent, Ohio, did a rattling business with his big Kent mixer, which was loaded with the rattlingest kind of material.

The Kramer Automatic Tamper Company, Peoria, Ill., exhibited a full-sized tamper and three models, in actual operation. The power for this tamper is a 5-horsepower Common Sense gasoline engine, the machine's capacity being 800 per day. The exhibit was in charge of G. W. Kramer, assisted by W. H. Janssen, F. O. Kramer, J. L. Shannon and a force of demonstrators.

The Lansing Wheelbarrow Company, Lansing, Mich., showed a large assortment of special wheelbarrows and carts for handling cement. H. H. Ames presided at this exhibit.

P. H. Learner, Elwood, Ind., exhibited the Learner ventilated flue machine with shingle attachment. Mr. Learner was assisted by Mrs. P. H. Learner and E. R. Learner.

The Lehigh Portland Cement Company, Ltd., of Belleville, Ont., Canada, of which Alfred W. Thorn of Buffalo is vice-president, is building the largest mill in the Dominion of Canada at a cost of over $1,000,000. The company had on exhibition large photos showing the progress of the work, etc. Mr. Thorn was assisted by Col. C. T. O'Neill and E. C. Shimer. They handed out souvenirs in the form of watch fobs and lead pencils.

The Lumen Bearing Company, Buffalo, N. Y., exhibited the Lumen cone bearings for Griffin mills, Lumen bushings and bearings for other types of mills, and Yankee and Lotus brands of babbitt metal. The exhibit was in charge of F. H. Warren, assisted by H. R. Forbes.

The Marblecrete Products Company of Akron, N. Y., and Columbus, Ohio, had a display of materials made by their process, including enameled concrete blocks, brick and stone work, wainscoting, raised panel work, flooring and floor tiling. J. R. Thomas, R. N. Cunningham and P. J. Hopkins explained the merits of the proposition.

The Te-Pe Company of Chicago had a display of their waterproofing materials, in charge of W. Scott McDonald.

T. M. Meek demonstrated the Chicago concrete mixer and was busy every day telling the visitors of its good points.

The P. B. Miles Manufacturing Company, Jackson, Mich., showed a No. 2 Miles concrete building-block machine in actual operation. They demonstrated various designs of face-plates and had a display of stone made on this machine. The booth was in charge of D. P. Vining, assisted by J. N. Morehouse. W. J. Corbett and Vining Bros. The last-named manufacture the "Miles" in Canada.

The Mobile Portland Cement Company, Chicago, showed cement materials, rock and clay from St. Stephen's Bluffs, Ala.

The Multiplex Concrete Block Machine Company, Toledo, O., exhibited the Multiplex concrete block machine and accessories. They also displayed a section of wall showing the system of construction. The booth was in charge of W. R. Dawson, assisted by R. E. Teets and A. F. Seibel.

Charles Mankedink of Sullivan, Ind., inventor of a new system of reinforcing adaptable to all possible forms of construction, arches, columns, sills, floors or walls, was at the show. Mr. Mankedink said that he would sell his patent rights if he found the right man, but in all probability he will have the material manufactured and sell it direct to the consumer. It is a rapid, cheap and simple method of reinforcing concrete and looks like a winner.

The Miracle Pressed Stone Company, Minneapolis, exhibited the entire Miracle line, including fancy molds, block machines of various sizes, sewer pipe molds, brick machines and specimen blocks. The booth was under the charge of O. U. Miracle, assisted by R. O. Miracle, A. S. Wemple, F. H. Conklin, John Miller, Charles Simpson and G. P. Layborne.

Dr. Charles McKenna, New York City, demonstrated laboratory tests.

The National Roofing Company, Tonawanda, N. Y., displayed samples of their well-known "Security" brand and other makes of asphalt roofing.

The New Way Motor Company, Lansing, Mich., showed 2, 3 and 6-horsepower "New Way" air-cooled gasoline engines for mixers. The booth was in charge of C. L. McHenry, assisted by E. A. Lucia and T. F. Sparks.

The Northwestern Expanded Metal Company, Chicago, exhibited the sixteenth-scale floor bay that attracted so much attention at the Chicago show; also their system of concrete reinforcing. The exhibit was in charge of A. W. Rush, assisted by W. A. Salter and Marc Jones.

A new proposition is the Ormsby mortar gauge for laying concrete blocks and bricks. George S. Ormsby of Xenia, O., is the patentee. He also makes silo and porch-column gauges. Mrs. H. Ormsby had charge of the exhibit.

Ralph Raber was kept busy explaining the merits of the concrete tile machine which the Raber-Wiltrout-Lang Manufacturing Company of Kendallville, Ind., manufacture. This machine makes drain tile or bell tile on the same machine. The principle is to remove the machine, not the tile.

The Parker Hoist and Machine Company, Chicago, displayed the No. 1 Parker patented derrick and distributed some interesting literature. The exhibit was in charge of F. H. Parker, assisted by H. L. Parker.

The Peerless Brick Machine Company, 13 Sixth Street, Minneapolis, showed Peerless brick machines and a large assortment of specimen bricks. L. V. Thayer, president, presided, assisted by J. J. Palmer, E. C. Goodwin, G. V. Thomson and L. M. Thomson.

The Pennsylvania Cement Company, New York, showed a cement cast bust of William Penn, the famous Pennsylvania brand used in the making; also photos of prominent works using the brand. W. W. Bale was in charge.

The Perfection Block Machine Company, Minneapolis, demonstrated their full-sized pressure block machine with its full equipment. This concern showed the process of making a block a minute by actual time, using the regular equipment of power mixer, steam-seasoning kiln, belt conveyors and the mammoth pressure block machine with a pressure of 200,000 pounds. The exhibition was in charge of President W. L. Dow, assisted by E. W. Dow, secretary and treasurer, M. K. Sawyer and J. T. Summers.

The D. & A. Post Mold Company of Three Rivers, Mich., had a display of their cement post molds, anchor post molds and a section of wire fencing showing the method of attachment.

The Queen City Brick Machine Company, Traverse City, Mich., showed a model of No. 5 Helm press for pressed brick, two-piece and veneer pressed stone; a model No. 8 Helm press; an Automatic face-down block machine, with self-locking mold box; also a combination sidewalk tile machine for making hexagon and diamond shapes. The exhibit was in charge of C. J. Helms and E. G. Williams, assisted by F. E. Smith, J. R. Thomas and George Coulter.

The Ray Manufacturing Company, Philadelphia, showed their block and brick machinery; also pier molds. The booth was under the charge of S. E. Gilbert, president of the company, assisted by A. R. Haller, superintendent of the Philadelphia factory, and F. W. Dunn.

C. M. Runyon of Canal Dover, O., was on hand with his full line of concrete block machinery.

The Sandusky Portland Cement Company, Sandusky, O., showed raw materials and finished product from the Ohio, Indiana and Illinois mills which manufacture the Medusa brand; also a display of White Portland cement materials and examples of ornamental white Portland cement work from the York, Pa., mill. These people showed and demonstrated the Medusa waterproof compound. The exhibit was in charge of P. B. Beery, assisted by R. R. Fish and F. J. Morse.

The Sanford-Painter Company, Toledo, O., showed two Sanford presses, one in operation, manufacturing hollow block, and the other making slab or veneer blocks. The exhibit was under charge of Joseph I. Cox, assisted by William A. Fowler and August Radtke.

The Svenson-Shuman Machine Company, Pittsburg, exhibited the Svenson concrete mixer, with machine in working demonstration. John Svenson was in charge.

The Simpson Cement Mold Company, 496 High Street, Columbus, O., showed molds for making porch columns, balustrade and other ornamental concrete work, also a display of the blocks made from them. Another feature of this exhibit was about 100 photographs of houses, walls, etc., on which these machines produced the work. The booth was in charge of H. G. Simpson, assisted by E. A. Bendig, and A. W. Ross, demonstrator.

The Star Cement Block Machine Company, Dallas City, Ill., displayed the Star block machine complete with dies, face plates for various widths, lengths and heights. The booth was in charge of William Yeoman, assisted by L. M. Dawson.

The Standard Asphalt Rubber Company, Chicago, showed the Sarco waterproofing applied to concrete by various methods, for waterproofing railroad subways, bridges, reservoirs, buildings, etc. M. Tipper was in charge, assisted by James R. Valk.

The Standard Paving Company, Newark, N. J., displayed a sanitary stall floor with model; also a weather strip and a variety of cement-working tools. The booth was in charge of W. W. Schouler.

The R. Z. Snell Manufacturing Company, South Bend, Ind., showed the Snell concrete mixers Nos. 0, 1, 2 and 3. The booth was in charge of R. Z. Snell, assisted by Adam Hunsberger and Charles Hunsberger.

The Sterling Wheelbarrow Company, Milwaukee, Wis., displayed a complete line of various styles of wheelbarrows and carts for handling concrete. This booth was in charge of H. H. Baker, assisted by Beals & Co. and C. L. McHenry.

The Trussed Concrete Steel Company, Detroit, Mich., displayed a full line of products for reinforcing concrete, including the Kahn trussed bar rib metal, cup bar and column hooping; also rib lath and rib studs. The exhibit was in charge of L. A. Pratt, assisted by F. C. Ayers and others.

The Thomas Cement Construction Company, Joliet, Ill., demonstrated the Thomas block machine by actual operation. They also showed a section of wall showing features of construction, both in straight wall and corners. Major Robert Mann Woods was in charge, ably assisted by A. N. Porter and W. L. Skeel.

Toch Brothers, New York City, showed samples of waterproofing paints and samples of work done with their products. They also gave out interesting literature. Their booth was presided over by A. McIntosh.

The United Cement Machinery Company of Plain City, O., had one of their Positive mixers on exhibition. In charge of G. Jaeger. This company had a special reduction sale on.

Smead C. Craft of Coldwater, Mich., exhibited something new in the way of a veneer block machine. It is simple of construction and inexpensive.

The Automatic Level Company, Toledo, Ohio, showed Hight's micrometer, grade finder and level, a very serviceable instrument in concrete construction. H. C. Russell had charge.

Somers Brothers, Urbana, Ill., showed their pressure block machine in operation, and also over 200 different faces and designs in various sizes. Frank A. Somers had charge, assisted by E. H. Somers, John Gray, D. C. Leaw, J. C. Leaw of Ocean Grove, N. J., and J. R. Hoke of Hanover, Pa.

One of the first of the large exhibits which greeted the visitor on coming into the show was that of the Buffalo Concrete Mixer Company. Two mixers were shown. The exhibit was in charge of J. M. Carter, W. J. Knowles, A. S. Williams and Hitchcliff.

The quarters of the Universal Portland Cement Company, Pittsburg and Chicago, were well decorated with Universal publicity and subjects that constantly reminded one of the Universal brand. Open house was in order here. The booth was under the charge of B. H. Rader, Eastern sales agent, assisted by J. L. Nelson, F. E. Bryan, E. R. Diesel, W. S. Wing and J. P. Beck.

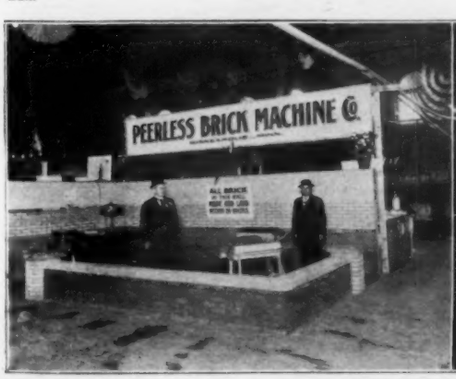
The Vulcanite Portland Cement Company, New York City, showed rock clinkers and finished product; also a variety of photos. A fine collection of concrete flower pots was also displayed. The booth was in charge of Albert Moyer, assisted by Thomas S. Young.

Wadsworth, Howland & Co., Boston, Mass., exhibited a photograph and booklets pertaining to Bay State brick and cement coating, a paint for cement, concrete, brick and plaster. The exhibit was in charge of E. A. Foster.

Wettlaufer Brothers, Buffalo, N. Y., showed a complete line of cement machinery, also No. 6, No. 16 and No. 24 brick machines.

The Whitehall Portland Cement Company, Philadelphia, Pa., dispensed cheerfulness in large quantities and also kept open house for all visitors. Their booth was neatly decorated and arranged appropriately for the occasion. Venus occupied the center of the stage, and near by was the famous cement settee and a vase holding a beautiful fern. At this booth were found H. B. Green, sales manager; C. P. Robinson, H. F. Rauch, W. T. Mansfield and F. B. Geddes.

Charles E. Zimmerman, Syracuse, N. Y., exhibited a metal base for wood porch columns and demonstrated his system.



TYPICAL EXHIBITS: 2. HERCULES MACHINERY. 3. CEMENT BRICK MANUFACTURED ON THE GROUND.
4. A CHARACTERISTIC MACHINERY EXHIBIT.

SAND-LIME BRICK

Notes from Our Traveler in California.

SAN FRANCISCO, Jan. 10.—The Holland Sandstone Brick Company have a large factory at Antioch, Cal., which is equipped with machinery from the American Sandstone Brick Machinery Company, and they use a Komnick press. The manager, O. M. Tupper, whose office here is at 268 Market Street, says business has been good, and that for some months their shipments had reached over a million brick per month. Mr. Tupper said that three buildings, which had been faced with their brick, went through the fire in good shape. The company has tried several makes of lime and prefers the Grand Canyon. The company also deals in fresh water sand from San Joaquin River, and shipped during November over four thousand tons.

LOS ANGELES, Jan. 13.—The Pacific Sandstone Brick Company (F. B. Cole, manager), have an office at 313 American National Bank Building. They use the White press and are doing a good business. Among other buildings they are furnishing brick for Carnegie Library at South Pasadena.

At the office of the Empire Stone Company, 313 American National Bank Building, Manager F. A. Boise said the company was engaged in turning out imitation of granite facing. They use the American hydraulic two-piece machine and also do considerable hand work. The most important job on which their stone was used is the great Auditorium Building on Fifth and Olive Streets.

Pure Granite Sand in Oklahoma.

L. G. Sheddan, of Lawton, Okla., writes ROCK PRODUCTS as follows:

"Owing to circumstances over which I have had no control my company is not doing anything at the present time. In fact, it is a new concern and has done nothing so far except to ship sand, of which we have the finest that I have ever seen. It is pronounced by experts to be the best material for concrete purposes and for roofing materials that can be found, as it is a pure granite. I have an inexhaustible supply of it. In addition to this I have a fine grade of limestone for burning into lime and for crushing purposes.

"I have had this lime and sand tested for the manufacture of sand-lime brick, and the reports on it are very gratifying. This deposit is also practically inexhaustible, I have traveled over the entire United States in the last five years and I must say that I do not know of a better location for a cement, stone crushing, lime burning, sand shipping or sand-lime brick plant than I have here.

"I will glady furnish any one who is interested with all the necessary particulars and will give him all the necessary assistance in getting hold of this, without any cost whatever on my part, as I am deeply interested in the development of these products."

Installing New Machinery.

SEATTLE, WASH, Dec. 27.—W. N. Durbin of Anderson, Ind., president of the Seattle Sandstone Company, was in the city recently looking after the installation of new machinery for the company's plant at Whidby Island, where the brick is manufactured. Mr. Durbin, who is a brother of former Governor Durbin of Indiana, is much impressed with Seattle, and believes that in its progress toward one of the largest cities of the country it has no rival. Speaking with regard to his own company, he states that many improvements are in view and that the new equipment will give the plant a daily capacity of 40,000 brick. The machinery will be installed and the plant ready for business within sixty days.

Changes in Organization.

BOISE, IDAHO, Jan. 7.—At the annual meeting of the stockholders of the Intermountain Building Material Company, Ltd., it was decided to change the name of the sand-lime brick division of the company's operations, which will hereafter be known as the Granite Brick Company, Ltd. It was arranged to increase the capital stock of the Granite Brick Company, Ltd., from $36,000 to $75,000, for the purpose of enlarging the output, which has found a ready sale. In the near future they will put in an additional press and many other items of equipment to make the plant all it should be.

Sand-Lime Brick in Idaho.

J. F. Koelsch, treasurer and secretary of the Intermountain Building Material Company, Ltd., the sand-lime products division of which is now known as the Granite Product Company, Ltd., writes as follows about their experience in the industry and conditions generally in that section:

During the early part of this fall we were shut down for repairs. Orders for brick have accumulated, and now we are hard pushed to get caught up.

Our limited experience in the manufacture of sand-lime products has taught us that in the proper preparation of the lime lies the secret of success. The hydration of the lime must not only be perfect, but it must have aged for a number of days before it is mixed with the sand. The idea of having a continuous operation of the plant by hydrating the lime as fast as the plant consumes it may work with some manufacturers, but has proven a dismal failure with us. We could not get uniform results in that way, and any business that involves an uncertainty as to the results obtained from day to day is not worth the price. It must be so operated as to eliminate all guesswork, and when this is accomplished the operator need not lay awake nights and worry as to the results of the day's run.

When we have completed the underground bin, which will be 11 feet by 20 feet by 18 feet deep, divided into three compartments, we will operate our plant in the following manner:

We prepare our lime by first crushing it to a 40-mesh fineness and finer. This crushed lime we then mix with sand in the proportion of two of sand to one of lime and pulverize this as fine as it is possible to do in a tube mill. (We don't get it as fine as we would like to have it in this mill.) As the mixture comes from the tube mill it drops into a heavy blade mixer, where the necessary water is added to insure the proper hydration of the lime. This wet material is then delivered to a short elevator which carries it to a screw conveyor over the underground bin, where it drops in one of the three compartments of this bin. Each of these compartments will hold enough dry hydrate to run the plant for three days, and in this way we will always have hydrate at least three days old.

When we make common brick we draw this hydrate from this bin and add the moist sand as it comes from the bank. In making this mixture we do not pass it through the tube mill, but convey it across the top of this mill on a belt conveyor which carries it to the heavy blade mixer under the tube mill. This mixer discharges the mixture into an elevator, and this conveys it to the double compartment bin in the upper part of the plant. We try to add just the correct amount of water to the mixture in the blade mixer under the tube mill so that it will be just right for the press the next day. We are very careful not to get the mixture too wet, but if it requires more moisture the next day we add this in the double shaft mixer into which the material is drawn from this bin. After the mixture has passed through this lower mixer it drops into a short elevator, which takes it to the hopper over the press. The one thing we still need is a good batch mixer, and we intend to add such an one a little later. We find that the double shaft differential mixer is a very unsatisfactory machine. It is a hard running machine and a very poor mixer. At this stage of the operation the operator must be able to control the temper of his materials, and this cannot be done with any degree of certainty in a continuous mixer. We believe more poor brick are made and greater harm is done to the press by the lack of uniformity of the moisture in the material upon its final delivery to the press than in any other stage of the work.

We are now operating the plant by the so-called division method, but have made many experiments in the manner as outlined above, using aged "sand-lime hydrate," and we are satisfied that when our plant is completed we will make as good a brick as it is possible to make with our materials. There are yet some serious difficulties to overcome before we can gain the success we desire. The question of the mortar not adhering to the brick has caused us some trouble, and we will be glad to have the association discuss this feature. We are also much annoyed with a heavy efflorescence on our brick when same are exposed to frequent wettings.

In this locality fuel is an important item, and its economic use must be carefully studied. In this connection we have recently devised a way by which we can utilize the steam from the hardening cylinder as it is turned off in the morning. Back of the boiler we have a 5-000-gallon tank which the fireman fills with water just before he is ready to turn off the steam from the cylinder. By turning this steam into this water we get it boiling hot and have a good supply of feed water for the boiler the next night. In this manner we save at least a part of this steam which otherwise would be wasted.

The Saginaw Sandstone Brick Company's plant at Saginaw, Mich., closed down for the winter, but will reopen as early as possible in the spring. Its output for the past year has been over 3,500,000 brick and its sales were over 4,000,000. It carries on hand now a stock of about 1,500,000. These brick are now being used in the new Valley Telephone Company building and a number of other important jobs in the Saginaw valley.

Enterprising Michigan Manufacturer.

JACKSON, MICH., Jan. 17.— The building of the J. E. Bartlett Company, of which a picture is sent herewith, is a good example of what can be done with sand-lime brick. The Bartlett Company are leaders in the building-material line in this section. Mr. J. E. Bartlett, the president, is also president of the Jackson Pressed Brick Company, which manufactured the brick used in the construtcion of the Bartlett Company's structure. Mr. Bartlett is a manufacturer as well as a distributor of cement, and his company handle everything else in the building-material line—common and fancy brick, lime and hydrate, mortar colors, wall plaster, Keane's cement, La Farge's cement, and waterproofing.

Sand-Lime Brick Industry in 1906.

The total value of the sand-lime brick produced in the United States in 1906 was $1,170,005, an increase of 20 per cent over the value ($972,064) in 1905. The value of the common brick made by this process in 1906 averaged $6.71 per thousand, as against $6.85 per thousand in 1905, while the front brick averaged $10.42 per thousand in 1906 and $11.02 in 1905. Almost 90 per cent of the product is marketed as common brick, a result that could hardly have been forcseen when the brick was first introduced into this country. The total number of plants has increased from sixteen in 1903 to fifty-seven in 1904, to eighty-four in 1905, and to eighty-seven in 1906, and bricks of this character are now made in nearly every State in the Union. New York is the largest producer, the value of the product in 1906 amounting to $191,000; and Michigan, with a product valued at $147,921, is a close second. California, Florida, Indiana, New Jersey and Pennsylvania each produced in 1906 sand-lime brick to a total value of more than $50,000.

An advance chapter from "Mineral Resources of the United States, Calendar Year 1906," on the production of lime and sand-lime brick in 1906, is now ready for distribution by the Geological Survey.

NECESSITY OF CARE IN THE MANUFACTURE OF SAND-LIME BRICKS.

BY DR. E. W. LAZELL, Philadelphia.

(Paper read before the Columbus Convention of the National Association of Manufacturers of Sand-Lime Products, December, 1907.)

The subject of this address was chosen after much thought and was suggested by the writer's experience and investigations in the sand-lime brick field. During the past few years a large part of my time has been devoted to investigating the materials from which sand-lime bricks are manufactured, the method of manufacture, and the testing of the product. It is only by such investigations that the best method of procedure can be arrived at. This should be clearly recognized when you call to mind that the basic process used by all manufacturers of sand-lime brick was discovered by Dr. Michaelis, Sr., of Germany, and that you are all following in the lines laid down by him.

MATERIALS.

Two materials are necessary for the manufacture of sand-lime bricks, namely, sand and lime, and as care must be taken with these we will start here.

Sand.—The sand best fitted for your purpose is a clean pure quartz sand. By this is meant a sand free from such impurities as clay, loam, lime, iron oxide or organic matter. The necessity for this is that during the manufacture a silicate is formed between the lime and the sand, and that any impurities present simply replace so much sand, and you have less of the material which enters into the silicate formation. Thus, any impurities in the sand, if not detrimental in themselves, act as a diluent.

The source of the sand can be any of those supplied by nature, such as dredged river sand, bank sand or crushed

EXAMPLE OF SUBSTANTIAL SAND-LIME BRICK BUILDING.

sand rock. A good brick can be manufactured from any of these materials.

Lime.—The lime best suited for the manufacture of bricks is a high calcium lime, thoroughly burned. Fortunately, this material can be procured in most parts of this country at a reasonable price. You should make it a point to thoroughly investigate the source of your lime and the method of burning. The lime must be thoroughly burned, but not overburned, and be of the kind known as quick- or easy-slaking lime. The burning should be done in kilns so arranged that the fuel does not come into direct contact with the lime. This is especially true if coal is used as fuel. At the temperature of burning the ash of the fuel can enter into combination with the lime-forming silicates, which not only destroys the caustic value of part of the lime, but often these silicate compounds are injurious, as they only hydrate in the steam cylinder. The lime should also be as free as possible from clayey material, since this material replaces part of the lime and thus decreases its caustic value. Further, this clayey material at the temperature of burning enters into combination with the lime-forming silicates similar to those formed by the ash of the coal, which silicates destroy part of the caustic value of the lime. These silicates hydrate very slowly, and often only after the bricks are in the steam cylinder, thus materially injuring the quality of the brick.

I would strongly suggest to all manufacturers who purchase their lime to insist if they buy the caustic lime that it contains at least 90 per cent of caustic lime (CaO); if hydrated is purchased, the lime should contain at least 70 per cent of calcium hydrate.

The effect of magnesia on lime used for the manufacture of sand-lime bricks is not so thoroughly understood, although the results of my investigations and others would indicate that the material is not as active as the lime, and that when present in large amounts it injures the strength of the bricks.

Another reason for insisting that the lime be burned in outside fired kilns in place of pot kilns is the danger of the lime becoming recarbonated in the pot kilns. At a temperature but little below that required to drive the carbon-dioxide out of the limestone the burned lime is able to reunite with carbon-dioxide forming again inert carbonate. This often occurs in pot kiln lime as partially burned pieces of coke and cinder are drawn below the burning zone when the lime is taken from the kiln and the gas they give off is reabsorbed by the burned lime. My own experience with partially recarbonated limes is that they are incapable of making a good brick. The same argument applies to lime which has become air slaked, therefore you should aim to use your lime in as fresh a condition as possible.

Method of Manufacture.

Having now described the properties required in the raw materials, we will take up the proportion of the material from which the bricks are manufactured. Nature provides an abundance of sand, but seldom supplies it in just the condition required for use. Thus the sand must be taken as it is received and prepared for the purposes desired. If the sand as it comes to the plant is wet, it must be dried, and this drying is advisable in any case, as all sand carries a varying proportion of moisture, and if the proportioning of the materials entering into your bricks is to be kept constant, you will have to use dry sand. The sand as received is seldom of the right fineness; hence it is often necessary to screen it to remove the coarser particles. While quite coarse particles, if not present in too large an amount, do not injure the strength of the brick, they do injure the edges and corners, and hence the appearance.

In one of my previous addresses I touched upon the necessity of grinding a portion of the sand to supply the deficiency of fine material. If the sand has been screened the coarser particles which are removed by screening can be ground to supply the fine material. By fine material I mean sand of such fineness that it will pass a sieve having 10,000 meshes to the linear inch; that is, the largest particle of fine sand must not be over .0055 inches in diameter. There are two very important reasons why there must be present in the brick sufficient fine material:

1. This fine material fills the voids between the coarser particles, thus giving a denser brick which will have less absorption.

2. The fine sand is that which reacts with the lime in the hardening cylinder, forming the bond of the brick. The speed of reaction between the two solid substances is directly proportional to the amount of surface in contact; the greater the number of surfaces, and hence the greater the amount of total surface, the greater the speed of reaction. Thus the presence of a sufficiency of fine sand increases the amount of silicate formed and the strength of the brick.

Proportioning the Mixture.

The means provided for this end should be such that there is always introduced exactly the required amount of lime, fine sand and coarse sand. There should be no more guesswork here than there is in the pharmacist compounding his prescription. Too much attention cannot be called to this necessity for a definite and accurate mixture, and one that will not vary from day to day, hour to hour or minute to minute. Mechanical means of proportioning should be used, and nothing trusted to chance.

When sufficient fine sand is not present in the material as it comes to the factory, which is generally the case, then it is necessary to grind a part. This being the case, it will be found advantageous to grind the lime with the sand either as quicklime and hydrated afterwards, or to grind the hydrated lime and sand together. All the sand required for the brick should not be ground, only that proportion required to be fine. If all the sand is ground, then the case is similar to where none is ground, and the bricks lack density and absorb a large amount of water. The same care must be exercised here in proportioning the mixture of sand and lime for grinding, to be sure that the proportions are always constant. A great advantage of grinding the portion of the sand required to be fine with the lime is that a much more even and intimate mixture is produced, and this mixture is composed of those materials which are later to unite in the hardening cylinder, forming the bond of the brick.

When the quicklime and sand are ground together it is necessary to hydrate them after grinding. Care and attention is required that sufficient water be added for perfect hydration, without any excess, which would give a damp mixture difficult to handle. In order that the hydration should be thorough it is advisable to store the hydrated material in bins or silos for 24 to 48 hours.

When the lime is hydrated previous to grinding with the sand the same care must be taken to assure complete hydration. If the hydrated lime is purchased the lime manufacturer must be compelled to deliver a perfectly hydrated material. The necessity of thorough hydration is because, if unhydrated particles of lime get into the brick, these will later hydrate in the hardening cylinder and either disrupture the brick or greatly injure its strength.

Having now prepared your mixture of fine ground sand and hydrated lime, it is necessary to add the required amount of coarser sand. A mechanical measuring or weighing device should be used here in order that the portions shall always be constant. These mixtures, being now in the dry state, must be moistened in order to render them plastic for the presses. The amount of water added must be so controlled that an evenly damp material is fed to the presses, as it is impossible to make good bricks with a material which is now wet and then dry. This practically brings your materials to the presses, and I am afraid you are all weary with hearing my insisting on exact proportions and care. My investigations, however, have convinced me that all this care is necessary and that eternal vigilance and exact proportions means the manufacture of good bricks.

The damp material should be fed as soon as possible to the presses; otherwise there is danger of its packing and setting in the conveying device and giving trouble.

The object of pressing the material is to get it in shape and to force as much into a given space as is possible. The press therefore should be fed in such a manner as to assure the placing of the same amount of material in each mold. This should be evenly scattered throughout the whole mold, and all corners and ends filled. The pressure placed on each brick should be uniform and should be preferably applied from both the top and bottom. Also this pressure should remain on a sufficient length of time for the material to adjust itself in the mold.

From the presses the bricks are piled on cars, and care is required here not to injure their shape, and the full cars should be placed in the hardening cylinder as soon as possible. If the cars containing fresh bricks are left in the atmosphere for any length of time they begin to dry out, and the lime near the surface absorbs carbonic acid from the air, thus rendering it inert. This recarbonation of the lime on the surface of the brick injures their faces, making them soft.

In placing the cars in the hardening cylinders they should be subjected to as little jarring and jolting as possible, as in the damp state the bricks have but little strength.

As soon as the cylinders are closed steam should be turned on gradually. If the steam is turned on too rapidly, and the mass of bricks heated up suddenly, there is danger of their expanding and cracking or breaking. The pressure used in the cylinders may be from 100 to 150 pounds, it being remembered that, the lower the pressure, the longer the time they must remain in the cylinder. With a pressure of 150 pounds from eight to ten hours generally gives a good brick. The action of this high pressure hardening system was discovered by Dr. Michaelis, and by it a union is formed between the lime and the silica of the sand, resulting in a hydro-lime silicate. This silicate is the binding material of the brick and unites the particles together. Your aim, therefore, should be to produce the maximum amount of this material and to change all the hydrated lime into silicate.

Some years ago when I first began the study of sand-lime bricks I doubted the formation of this silicate. A large number of experiments were made in our laboratory, both chemical and microscopic, and these convinced me of the existence of this silicate in the brick. The results obtained from some of these investigations were given to you in my address at Detroit in December, 1905. These investigations prove clearly that the lime and the sand reacted in the hardening cylinder, forming a silicate. Before this time Dr. Michaelis' investigations led him to the same conclusions, and he went so far as to give definite formulas to these compounds. Dr. Michaelis states that the two most common compounds occurring in sand-lime brick have the following formula: $5CaO.4SiO_2.4H_2O.3CaO.2SiO_2.4H_2O$. He states that these compounds dry to a very solid and hard mass which equals, in strength and hardness, Portland cement. In describing this he states further "after all the water has been driven off at red heat, it becomes denser, and, when exposed to white heat, its density was further increased, and yet it had not lost any of the hardness and solidity that it possessed in the hydrated state." "All these compounds can easily be obtained by my high pressure hardening process."

"These hydro-silicates are the main constituents formed by a combination of all kinds of silica with calcium hydroxide, when submitted to a high pressure hardening process invented by me, that is to say, in artificial sand-lime brick. If the process is properly directed no uncombined calcium hydrate should remain, which simply requires a sufficient quantity of powdered quartz sand, intimate mixing and sufficient time for hardening. If a perfect sand-lime brick thus obtained becomes brittle when exposed to the fire, the cause of it is the sand, which increases its volume in the fire. In dealing with imperfect products, however, we have to add the unfavorable behavior of uncombined lime and carbonate of lime which may have been present from the start or has been formed in the course of time. The carbonate of lime and the free lime are converted into soft calcium oxide by the fire, which means a decrease in volume. The hydro-silicates likewise decrease their volume on giving off water of combination, but their decrease in volume is of no disadvantage, because they form only thin films around the quartz grains. Moreover, the hardness which they possess in the hydrated state is not lost on dehydration by the heat. On the contrary, dehydrated calcium silicate is even denser and stronger."

It is only recently that as good an authority as Eckel of the United States Geological Survey has recognized the existence of these silicates. The first mention he makes recognizing their existence is in the late publication of the Geological Survey, "The Production of Lime and Sand-Lime Brick, 1906."

In further experiments undertaken in our laboratory we have been able to produce large quantities of this hydro-silicate by using very finely ground sand and hydrated lime. The mixture was pressed into the pats and exposed to the action of steam for a number of days. I, therefore, assume that you are warranted in stating that your sand-lime bricks are bound together with the hydro-lime silicate binder, which compound is produced in the hardening cylinder by the action of steam.

From the above you will understand why too much attention cannot be given to obtain the correct amount of fine sand in your product; also why you should be particular to obtain lime and sand containing no objectionable foreign materials. This is clear when you remember that the strength and fire-resisting qualities of your bricks depend upon all the lime being combined as silicate, with no excess, and that as little carbonate of lime be present as possible.

Recently reference has been made to the similarity between sand-lime bricks and cement, and this is, in a measure, true. There is, however, no similarity until the cement has been acted upon by water; the point in common being that the hydro-lime silicate formed by the action of water upon cement is similar to the compound formed by the action of steam upon finely ground sand and lime.

I trust I have made clear to you in this article the reason for the necessity of care and the use of exact proportions throughout the whole manufacture of sand-lime brick. Briefly summed up, the requirements are as follows:

Good sand.

Well-burned high calcium lime.

The correct amount of fine sand—that is, sand less than .0055 inches in diameter; preferably the grinding of the lime and fine sand together.

Accurate methods of proportioning the materials at each stage of the manufacture.

Good control of the amount of water used in hydrating; also amount added to the mixed materials to render them plastic.

A press capable of evenly and accurately filling the mold and exerting sufficient uniform pressure on each brick.

Sufficient pressure and time in the hardening cylinder to produce the maximum amount of the hydro-silicate binder.

If all these steps are followed out, the result will be a good brick. Further, the use of mechanical means to accomplish the above ends will not increase the cost of production and will result in your brick finding a more ready market.

POWER FOR SAND-LIME PLANT.

By W. J. Carmichael.

(Paper read before the Columbus Convention of the National Association of Manufacturers of Sand-Lime Products, December, 1907.)

Correct and useful results from any comparison of steam, gas and electricity for power purposes can be obtained only by a just and equitable summing of the conditions which surround each local factory.

It would be unwise for me to enter into a long detail of technicalities in the building up of "straw men" only to be knocked down at a loss of valuable time to my hearers.

Many of you have found the absolute necessity of working out in the most economical manner details which have confronted you in your particular location. Some of you have been fortunate in securing a site where fuel in abundance has been supplied at a nominal figure, while your brother brickmaker, located in a different section of the country, advises you that he is compelled to pay from three to four times the amount for his coal, but that he has secured at an exceedingly low figure electric power developed by a natural waterfall located on his property. Another writes that he has had the good fortune to strike a big flow of natural gas while sinking a well for water; and still another manufacturer is highly elated over the great economy noted by the burning of refuse from his near-by sawmill.

From the above you can readily see the difficulty encountered in any attempt to show comparison, which to the practical brickmaker is of such a varied nature.

If all natural conditions throughout the world were on an equality, we could easily determine the most economical as well as the most perfect apparatus and method of operation.

If you will carefully investigate the amount of average actual horsepower used in operating the machinery throughout the sand-lime brick factories of the world, you will find that average less than 125. Hence, any relative comparison must be based upon such average condition, and any attempt to arbitrarily show a comparison without taking into consideration the necessary steaming facilities for hardening sand-lime products would be unfair.

We admit that the so-called rated horsepower of our boiler plant used in the hardening of brick and other sand-lime articles exceeds that which is required to operate the entire machinery, and that custom has persuaded us to harden these products during the night time. Therefore we conclude the first cost of installation for boiler plant has not only taken care of the hardening of materials, but has given us an abundance of power to operate all machinery throughout the factory.

We all enjoy reading of and have become somewhat familiar with the gas producer, the gas-engine and the beauties of electric power, and the benefits derived from the use of this wonderful and especially attractive drive for large manufacturing plants where the unit system prevails and where position of any desired angle can be secured for any number of machines, resulting in a saving of valuable space and energy to the manufacturer.

But we as manufacturers of sand-lime products must consider our factory with its several machines all working in unison under a low-rated horsepower and the necessity of preparation for the hardening of brick or other products. After such consideration I believe you will agree with me that unless there is some unusual condition in the cheapness of electricity or gas, steam, whether generated from coal, gas or other fuel, stands paramount as the most economical factor in the operation of sand-lime brick factories.

It is not my intention to lay down a set rule to guide you in the selection of the most economical power-producer, but to bring before you the advisability and necessity of going into every possible detail surrounding your certain locality for the proper selection of your equipment for handling such known conditions. You may not feel capable of carrying out a thorough test to your complete satisfaction. Then by all means employ a competent engineer to assist in thrashing out the many technicalities which your location presents before you begin squandering your money on mistakes which should never have been made.

The subject as presented to me for consideration becomes one of vital importance to each brick manufacturer, in which there is no just comparison, and which he alone must work out for a correct solution of the most economical method of operation.

A TRULY HOLLOW WALL.

William Deane Ham's New Method of Steel Forms for Monolithic Construction.

The value and importance of the hollow wall in concrete construction have been long known and appreciated. There has never been any question as to the desirability of air-spacing in either blocks or monolithic construction. The fact that the hollow wall insures coolness in summer, warmth in winter

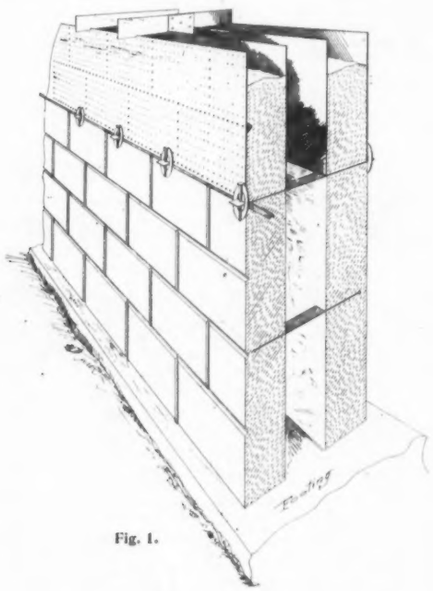


Fig. 1.

and dryness at all seasons has long been established. The only question at any time has been as to the best, most economical, most practical and most satisfactory method of obtaining the result. The illustrations herewith show a device which seems to cover every requirement and will undoubtedly make the inventor famous in the building industry. It covers a system of steel forms for the construction of a hollow wall consisting practically of two separate monolith walls, built simultaneously and tied every 15 inches both vertically and horizontally with iron or copper ties. The inventor is a Southern man, William Deane Ham of Knoxville, Tenn., and his invention is being exploited by a corporation formed for this purpose and known as the Monolithic Hollow Wall Company, with offices in the Monolith Building, New York City. The original patent covering the basic principles of Mr. Ham's invention is No. 845,635, which was issued February 26, 1907. Supplementary patents, covering important improvements, were issued April 9, 1907, and November 12, 1907, and the perfected invention, known as Ham's method of steel forms for building monolithic hollow walls, is now being successfully employed, having proved a pronounced success wherever introduced.

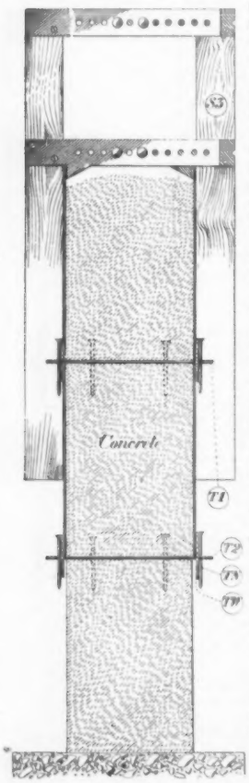


Fig. 2.

The illustrations herewith will show to the practical builder much more clearly than could be done in words just what Ham's method is, and just wherein it differs from and improves upon other methods. The first claim on which Mr. Ham's patent was issued is for "a mold comprising at least two inner members and two outer members coöperating respectively therewith, strips extending across the upper and lower edges of said members, and a spacing member disposed between the inner members." Other claims cover means for positively holding the several mold members in parallelism and in operative and assembled relation; a deflector to positively direct cement material into the spaces between the inner and outer members; scaffold supports; projections to prevent outward displacement, etc.

In Mr. Ham's original patent small wooden blocks were used under the ends of the ties through the wall, the original intention being to turn the ends of the ties down into the openings left after these wooden blocks were removed for the finishing, in order to give anchorage to the metal ties. These wooden blocks have now been eliminated by punching extra holes through the ties, instead of the tongues or projections that were formerly used on them, and the tie anchors are now made by driving nails in the holes through the ties, as shown in the drawing. This makes the outside and inside finish more easily accomplished, as by using a thin, sharp chisel the metal tie can be cut out to a depth of a half inch or more, making very little defacement on the surface, which is easily filled and leaves no mark where rubbed finish or pneumatic-hammer finish is used. The same plan is used in the tile wall and pebble-face wall, and, the tie being very thin, 1/16 of an inch in thickness by 1¼ inches wide, it is an easy matter to cut it out with a chisel, leaving only a very slight gash in the wall, which, of course, is pointed up with a trowel and brushed over to give a finished appearance, the same as the rest of the wall. The wire staple in the end of the mold sheet is very light and flattened on the back, where it comes in contact with the surface of the concrete. A slight indention is made in the surface of the mold sheet where this staple fits and brings the two ends of the sheet together, and when hammered into place leaves no impression on the surface. The molds, which are cut very accurate and true, are held in rigid position by the saddle spacer. There is no possibility of the wall being irregular if proper care is used in placing the sheets in position. In fact, the entire surface is left almost as smooth as glass, except for small pimples, about the size of a pinhead, and a light mark at the joints where the sheets go together. All of this, however, is easily and quickly removed by a very light rubbing with carborundum blocks or steel brush. (These joint marks do not show when mortar beads are used for cut-stone finish.)

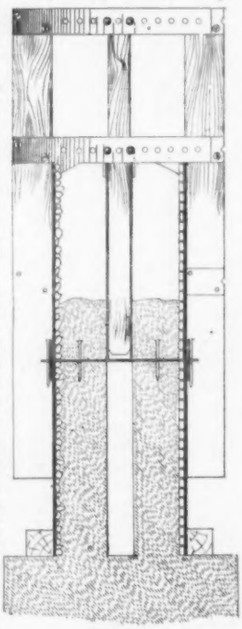
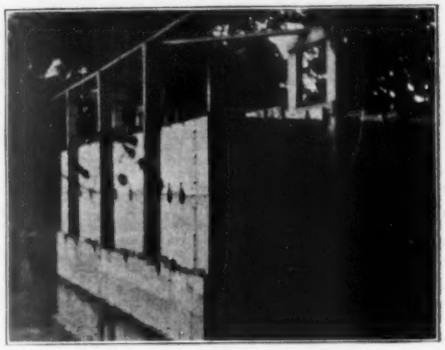


Fig. 3.

The paste used in holding the pebbles on the surface of the sheet (covered by patent 870,881) is quick-setting. It leaves a hard surface similar to rubber and brings out a very beautiful effect around the pebbles. The paste used in holding the tile to the mold sheets for the tile surface wall is a quick-setting paste, similar to billposters' paste, and can be very easily dissolved when water comes in contact with it through the holes in the sheet, after the concrete is thoroughly set.

The illustration (Fig. 1) shows only one style of plain stone-face wall, but with Ham's method any finish may be made quickly, perfectly and economically. The surface may be made as smooth as glass, requiring only kalsomine, paint or neat cement to complete the finish. By using wooden mortar beads, which are easily and cheaply attached by means of heavy tacks from outside the mold sheet, a perfect cut-stone or brick face is made. Artistic pebble facing is also an easy matter when Ham's steel forms are used, and exceptionally beautiful results are obtained by his method. Another valuable feature is that tile or ceramic mosaic wall may be produced at only a fraction of the ordinary cost.



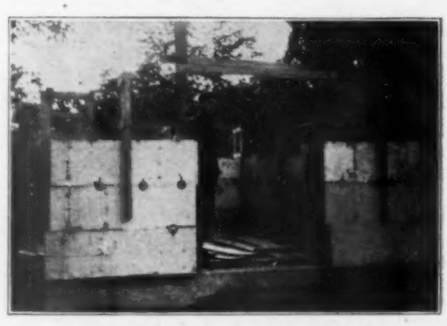
HAM'S METHOD IN PRACTICE. I.

The Ham method certainly accomplishes what its inventor claims for it. It makes possible the construction cheaply and easily of a truly hollow wall. The air space in this wall may be any width from 2 inches up, and the thickness of each of the single walls may be anywhere from one inch up. The thickness of inner and outer walls may be the same, or they may be of different thicknesses. They may also, if desired, vary in the material used in their construction. This is sometimes a very desirable consideration.

The steel mold sheets are made in all lengths from 1 inch to 60 inches. Holes in these sheets are 3/32 inch when punched, but the galvanizing nearly fills them up. One hole is punched in the center of each square inch of steel surface. These holes accomplish several ends. They allow air-bubbles to escape while tamping (but are too small to allow cement to escape). They are useful also when tacking on mortar beads, and to attach, by means of light copper wire, "embedded ornamentation," such as terra cotta or large, flat tiles; also to allow fastening of the edges of sheets when it is necesary to lap the edges in certain places. In order to overcome the joint-mark that results from lapped edges in any place, a composition paste of plaster of paris, etc., is used to bring the lap out to a feather edge. This is only necessary, however, on fine work, as the steel is only ⅛ inch in thickness and this lap does not show much and cuts no figure in the average rough factory building.

It is impossible to tell in a brief article like this all the good points and how many obstacles the inventor had to overcome in three years of constant study and experimentation, but the simple, practical invention as now perfected speaks for itself, and the accompanying illustrations will help the reader to a ready comprehension of its merits.

One of the half-tone cuts shows the corner of the fourth round set up for a large warehouse. Several improvements have been made since this picture was taken. The other shows the base wall complete and two rounds set up on a small building, with spacers in position to keep the walls plumb. Of the line drawings Fig. 1 illustrates the manner of making a cut-stone finish. Fig. 2 represents the ideal monolith solid wall, the cheapest and strongest wall that can be built. Fig. 3 is a section through a wall with Ham's method of pebble-face finish on the outer wall surface, tile-face finish on the inner wall and continuous air-space between the two monolith walls, making the "truly hollow wall," most artistic, absolutely sanitary and at the same time absolutely fireproof.



HAM'S METHOD IN PRACTICE. II.

CLAY

The American Creamic Society.

The tenth annual meeting of the American Ceramic Society will be held at Columbus, Ohio, February 3 to 5. The trustees have selected as headquarters the Hotel Hartman, located on the corner of Main and Fourth Streets. Two blocks away at the Great Southern Hotel, the National Brick Manufacturers' Association are to gather at the same time. The meetings this year will be separate in order to avoid confusion and overcrowding. Columbus is peculiarly situated with reference to the clay industries. While there are within its limits and vicinity few plants of importance, it is, nevertheless, the market point and financial center of a large number of important establishments located within a belt of 50 to 75 miles. Some of these plants were visited on the occasion of the Zanesville summer meeting of the American Ceramic Society. There will be a lecture, illustrated by lantern slides, on Wednesday evening, February 5, at the Great Southern, showing special features of a number of these plants.

Columbus is of special interest to members of the society because of the fact that its formal organization took place there and its offices and headquarters are located there. Other special objects of interest in Columbus are the ceramic department of the Ohio State University, the pyrometric cone factory and clay-testing station of Professor Orton, and the ceramic engineering bureau of the Richardson-Lovejoy Company.

The program as officially given out is unusually rich in entertaining as well as instructive features.

The twenty-second annual convention of the National Brick Manufacturers' Association will begin at 2 p. m. Wednesday, February 5, and close Friday, February 7. The members of the Ceramic Society are invited, as heretofore, to enter into and enjoy these meetings and the attendant social festivities.

Iowa Brick and Tile Association.

The twenty-seventh annual meeting of the Iowa Brick and Tile Association was held at Des Moines, Iowa, January 22 and 23, 1908. This was the largest convention in the history of the association, 139 members being on the register. The following officers were elected for the year:

C. L. Smith, Mason City, Iowa, president; George Schnurr, Kalo, Iowa, vice-president; C. B. Platt, Van Meter, Iowa, secretary; F. A. Stephenson, Mason City, Iowa, treasurer.

A number of excellent papers were given, chief of which was undoubtedly "Life of Cement," by G. G. Wheat, Emmetsburg, Iowa. This was illustrated by stereopticon views, and its main point of issue was a discussion of the solubility of cement in water.

The clay workers were welcomed by G. W. Mattern, Des Moines, Iowa, to which Judge J. L. Stevens, Boone, Iowa, made suitable response. F. M. Okey, in charge of the Engineering Experiment Station of Ames College, read a paper on "Comparative Value of Large Tile over the Smaller Sizes," recommending that no smaller drain tile than four inches in diameter be laid in the ground.

Other interesting papers were: "The Economical Handling of Clays by Means of an Aerial Wire Rope Tramway," "Producer Gas for Power," "Electrical Power, Its Generation and Use in Clay Plants as a Means of Power Economy," and "The Ceramic School, Its Value to the State and to the Clay-working Trade."

The clay workers were entertained at a banquet on January 22, and before the conclusion of the session they adopted a resolution which had been presented to them by the Illinois Clay Workers' Association, involving the appointment of a committee of publicity which should work with similar committees appointed by other organizations with the ultimate view of creating a general bureau of publicity for the clay-working industry of the United States.

Illinois Clay Workers' Association.

The thirtieth annual meeting of the Illinois Clay Workers' Association was held at Peoria, Ill., January 14 to 16. Tuesday morning was devoted to registration and renewal of acquaintanceship, and in the afternoon the session was opened by an address of welcome from Hon. Thomas O'Connor, mayor of Peoria.

Walted D. Pratt of Earlville, Ill., then read his presidential address, in which he concisely represented the conditions of the industry and urged the co-operation of the clay workers of the State with the Ceramic Department of the University of Illinois.

Many interesting papers were presented to the association during the three days' session. Among the chief of these were papers by Prof. C. W. Rolfe, Champaign; J. M. Mamer, Campus; E. Hardy, Momence; Marion W. Blair, Terre Haute, Ind.; F. W. Fitzpatrick, Washington, D. C.; A. V. Bleininger, Urbana; F. Plum, Streator, and Walter H. Kirk, Peoria. The most interesting paper of all these was undoubtedly that on "Clay versus Cement Fireproofing," by F. W. Fitzpatrick, Washington, D. C. The main contention of the paper was that the two products each had their proper place, but should not be injudiciously used as substitutes for each other where their inadaptability to the requirements of the situation was apparent. Considerable commendation was given the cement people for their aggressiveness in introducing their product to the public.

Walter H. Kirk of Peoria, Ill., a local attorney and councillor of considerable repute, delivered a valuable paper on "Personal Injury Claims Against Clay Workers." Though the title would imply that the subject matter of the paper was especially applicable to clay companies, in reality it was a concise legal presentment of the limits of the responsibility of the employer to his employee in case of personal injury. As far as we know, no paper of similar value has been presented before an association of this character.

Prof. C. W. Rolfe, in an address entitled "The Ceramic Department of the University of Illinois and What it Is Trying to Do," gave a detailed description of the Ceramic Department and also explained the amount and direction of the work which had been accomplished by the department during the year 1907.

At the close of the convention the association elected the following officers: President, William Hammerschmidt, Lombard; vice-president, F. R. Carter, Peoria; secretary, George H. Hartwell, Chicago; treasurer, J. M. Mamer, Campus.

The name of the association was changed from the Illinois Clay Workers' Association to the Illinois Clay Manufacturers' Association, the reason being that mistaken impression was often created when bringing the convention to a new town or city, the idea being that, instead of manufacturers, the members of the association were bricklayers.

The attendance was good, being the second largest convention in the history of the association.

An Old-Established Business.

SACRAMENTO, CAL., Jan. 6.—In the Capital Sewer Pipe Works, whose plant is situated on the corner of Thirtieth and K Streets, Sacramento has a large and successful industrial establishment. The proprietor, H. C. Muddox, said that the business was estblished by his father in 1878. Recently a new factory has been built—80x160, with a separate building used as furnace room, 44x160. The buildings are constructed of concrete blocks made by the company, as they also take on some contracts in this line. They have two Ideal and one Wingate machine and use the Standard brand of Portland cement. The main building is three stories.

A feature of the factory is that their six kilns (furnished with oil burners) are covered with a galvanized roof. As Mr. Muddox remarked, they do not wish their operations to be interrupted by the weather. They have the entire output of the factory for the coming six months contracted for. At present they are not making any pipe above 30-inch.

Making a Good Record.

FRESNO, CAL., Jan. 4.—The Fresno Brick and Tile Company, whose office is at Mono and H Streets, manufacture pressed and common brick and deal in tile of all descriptions. E. M. Prescott, vice-president and manager, says that less than twenty-five years ago there was but one brick building in Fresno, which has since become a city of nearly 30,000 inhabitants. The company furnished for the new Federal Building upwards of six hundred thousand brick without a single rejection on the part of the inspector. Their season's run will approach six and a half million brick. Oil is used at the kilns, and they have an underground brick tank with storage capacity of 2,000 barrels. The company has been established six years. Mr. Prescott thinks the outlook is very flatering.

SAND AND GRAVEL

AN UP-TO-DATE ILLINOIS PLANT.

Operations of the Illinois Valley Sand Company near Ottawa.

The Illinois Valley Sand Company, whose property and plant are located about four miles west of Ottawa, Ill., was organized February, 1907, at Bloomington, Ill. The company purchased the property and plant from a small operator and produced from this plant all the output for the year 1907 and until the completion of its new buildings and equipment. The present officers are: Silas Ropp, Chicago, president; Milan P. Lantz, Carlock, Ill., vice-president; James P. Hackett, Bloomington, Ill., secretary, and W. D. Moore, Bloomington, Ill., treasurer. The company is capitalized for $50,000, all the stock being subscribed for and paid in. It is controlled principally by Bloomington people.

To the energetic president, Mr. Ropp, is due much credit for the way the company has been organized and the business put on its present basis. As a rule, a plant of this kind meets with delay after delay, but this was not the case here, for even through the most depressing influences the work was steadily pushed to completion, and the visitor today meets a sight of operations not only interesting but impressive. Not only has the company been organized, but a complete new plant has been constructed in less than a year, and at the same time daily shipments have been made from the old plant.

With a uniform product of splendid quality, an equipment second to none for the handling of it, and ample capacity, this concern may be considered one of the foremost in the business. Certain it is they have every economical method for production, and every order they may take will be assured prompt shipment, for all departments are in the hands of competent men, thoroughly conversant with their business.

The new plant just put into operation is equipped with all the latest and most modern machinery for the automatic handling of sand. Everything about the equipment is the best that money can buy, and the special features and unique devices of construction are of particular interest. The location is on the Chicago, Rock Island and Pacific Railway, and the company owns 170 acres of sand property, besides having a lease on adjoining property. It controls a frontage of two miles along the railroad track, varying from half a mile deep to 100 feet from the railroad. About 1,200 feet of railroad track is now in, and eventually they will have shipping and trackage facilities for the storage of 80 cars. The capacity is 40 cars per day.

The analysis of the sand, which was made by Mariner & Hoskins, chemists, of Chicago, showed that it consisted of:

	Per cent.
Silica	98.1
Oxide of iron	0.3
Alumina	1.1
Lime	Traces
Loss on ignition, chiefly water of combination	.5

In the pits the sand occurs in the form of a very soft rock, and the grains are bonded together by clay. Silica grains in the sand are white or transparent in color, but the iron oxide contained in the clay gives the sand a yellowish cast, varying from very light yellow to ochre, depending on the depth from which the sand is taken. The general run, however, is a light yellow in color. The sand as it is taken from the pits contains a little over 3 per cent moisture. For this reason and in this condition sand readily freezes in the winter time, especially when it is on the car. To be able to make shipments for their trade in the winter time the company has installed a drying system, which is an innovation in a sand plant.

The sand produced here is especially adapted for foundry purposes, and will be used in other industries, such as concrete work, plaster, sand-lime brick manufacture, sawing stone, etc.

The company have already secured a contract for a term of years from a large foundry company which guarantees to buy all the sand they need in their works. About ten thousand tons per month is required by this concern alone.

The sand rock on the company's holdings lies in the form of bluffs from 30 to 60 feet in height, the

face extending in an easterly and westerly direction, parallel with the main line of the Chicago, Rock Island and Pacific Railroad and the Illinois-Michigan Canal. From 6 to 10 feet of loam, clay, shale and coal lie on the top of the sand rock, and this has to be stripped prior to the excavation of the sand. It is necessary to shoot this sand rock, and 40 per cent dynamite is used as the explosive agent in this work. In the old plant of the Illinois Valley Sand Company—as today with all others producing the same character of sand in this district—the practice was to simply shoot down the sand, throwing out the larger lumps and loading the remainder in the car. Under these conditions the sand on its arrival at destination had to be run through crushing machinery to get it uniform in size before it could be used. In the winter operations had to be suspended on account of the sand freezing while in transit. As a result it was necessary for the users to accumulate a large stock in the summer. To deliver a product crushed thoroughly so as to be immediately adaptable on delivery for the consumer's use, and to be able to ship dried sand during the winter months so it would not freeze in the cars, the Illinois Valley Sand Company has, at a cost of over $50,000, erected the present plant.

At present they are working into a bank about 200 feet from the first mechanical conveyance. After the sand is shot down from the bank it is loaded into a 6-yard side dump car by a 45-ton Bucyrus steam shovel. The cars, in trains of five each, are hauled to the platform by a 30-ton Brookes locomotive. The contents of the cars are then dumped onto an incline grizzly or stationary screen composed of pieces of railroad iron about 10 feet in length and set 2½ inches apart. The undersized from the grizzly falls on a 30-inch belt conveyor, which takes it up and into the screen a distance of 100 feet. The oversized product is fed into a set of 30x36-inch spike crushing rolls, which break the material down to the maximum size of 1½ inches, this product dropping on the above mentioned belt conveyor. The 30-inch belt conveyor discharges into a bin of some 40 tons capacity, from which the material is fed by an automatic feeder onto a 6x15-foot shaking screen, which is provided with a woven wire covering having ⅜-inch square openings between the wire. The oversized is elevated from this screen into a set of 30x10-inch smooth-faced high-speed rolls set directly over the screen. These rolls reduce the pieces which will not pass the screen to a suitable size for passing, and their product is dropped into lower bins. The screened product then falls to a 24-inch belt conveyor, which takes it up and into a steel storage bin 45 feet high and 25 feet in diameter, having a storage capacity of 1,100 tons of sand. From this tank the material may either be spouted by gravity to the cars for shipment or it may be spouted onto the bucket elevators up and into bins of the dryer-house.

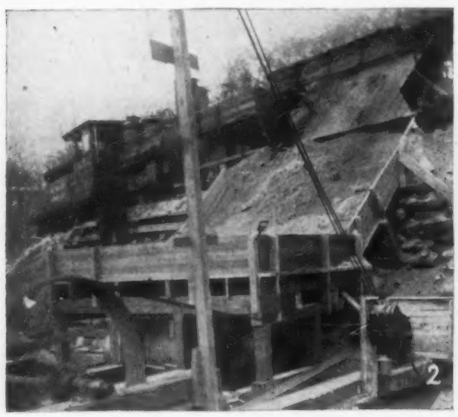
This dryer-house is a building 96x42 feet and contains besides three bins, two 54 inches by 40 feet revolving dryers, through which the sand is passed. The drying is accomplished by a brick firebox at the far end of each dryer. A coal fire is kept, the flame passing into the dryer, the smoke and steam being drawn through by a blower system or fan in the chimney. These dryers are the same type as are used in cement plants or in mining work. The sand, after it has passed through these dryers, is spouted by a cross belt into a bucket conveyor and up into a steel tank or storage bin of the same height, diameter and capacity as the other tank, in which the green sand is stored. The dry sand coming from the dryers gives off steam, and the engineer says that the two dryers, having a capacity of 1,000 tons in twenty-four hours, give off nearly 40 tons of water.

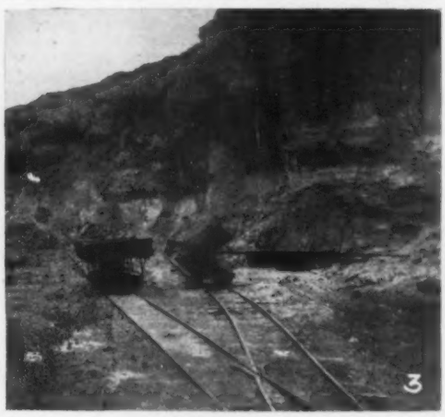
The entire plant is automatic in its operations, and no manual labor is required, excepting that for attendance on the machinery, feeding of the first crusher, and firing of the dryers, and in all about eighteen men are employed, working in two shifts.

The entire plant is electrically driven, 3-phase, 60-cycle, 220-volt alternating current being employed. The different sections of the plant are each driven by its own motor, so that any section can be started or stopped without in any way interfering with the operations of the rest of the plant. The current is supplied from a central power-house, in which is located a 115-kilowatt, 220-volt, 60-cycle, 3-phase generator, driven by a 14x14-inch high-speed automatic engine, which is supplied with steam by a 72-inch by 18-foot return tubular boiler. From this same source the entire plant is lighted at night by arc lights at the principal points, supplemented with incandescents.

All the buildings of the plant are of heavy timber construction and rest upon concrete foundations, which in every case were carried down to "hard pan." The capacity of the plant will be in excess of one thousand tons per twenty-four hours, and, by reason of the arrangement of the plant and installation of automatic machinery wherever practical, the plant can be operated with a minimum of labor, resulting in a very low cost of production.

The J. C. Buckbee Company of Chicago designed and supervised the erection of the plant. S. B. Reed, superintendent, in charge of construction and local operations, is an experienced sand operator.





THE BIG SAND PLANT AT OTTAWA, ILL.

1. General View of Plant. 2. Dumping Sand on Platform for Grizzly Screen. 3. Sand Rock Bluffs on Company's Property. 4. Bucyrus Steam Shovel at Work. 5. Steel Silo for Storing Sand.

Prize Offered for White Silica Sand.

PORTLAND, ORE., Jan. 5.—The Columbia Steel Works of this city make the following offer: "We will take 100 tons each month of silica sand, 98 per cent silica, and free from iron oxide, delivered at Portland at not to exceed $6 per ton, and we will pay $100 in cash to the discoverer." Frequently it has been reported that discoveries of pure silica sand have been made in Oregon, but thus far there was invariably something lacking in quality or quantity. Silica sand is now being shipped to Portland and other iron and steel manufacturing centers of the Pacific Coast from Minnesota.

More Business Than They Can Handle.

LINCOLN, ILL., Jan. 2.—The Hydraulic Sand and Gravel Company closed their season's work about the middle of last month. The report from the gravel bed is that it is producing as well as could be hoped for and that the company has more orders than it can fill and ship out to the market. Both sand and gravel companies have more business than they can handle owing to the big demand for sand and gravel for concrete and ballasting work.

Protest Against Increase of Switching Charges.

TERRE HAUTE, IND., Jan. 13.—Charging that its business is damaged by the switching rate of the Southern Indiana Railway Company, the Wabash Sand and Gravel Company of Terre Haute has appealed to the State Railroad Commission for satisfactory adjustment of rates. The rate, it is said, was formerly $3 per car, but was later changed to 15 cents per ton. The Wabash Sand and Gravel Company asks that the former rate be restored. The case will come up before the commission January 23.

New Incorporations.

At Joliet, Ill., the Joliet Sand and Gravel Company. Capital, $50,000. Incorporators: F. A. Hoover, J. A. Bray, G. N. Blatt.

At Mobile, Ala., the Spotswood Sand and Gravel Company. Capital, $20,000. Incorporators: H. L. McConnell, W. C. Spotswood, H. B. Mendenhall.

At Cincinnati, O., the Contractors' Sand and Gravel Company. Capital, $10,000. President, T. F. McClure; secretary and treasurer, E. F. Gray.

Large Gravel-Handling Equipment.

SAN FRANCISCO, Jan. 3.—The Bay Development Company are large handlers of gravel, which is brought principally from the Napa River, being towed on barges. The company have quite a large equipment, including a pumping station on the river, a vessel with pumping machinery which is also a carrier with gasoline power, two barges and tug boats. Gravel is delivered to the job and sold from bunkers at 153 Berry Street or the Green Street wharf. The office of the company is at 153 Berry Street. Frederick Maurer is the president and E. H. Rix manager.

FROM OUR OWN CORRESPONDENTS

New York

NEW YORK, Jan. 20.—When the representative of ROCK PRODUCTS called at the office of the Edison Portland Cement Company, in the St. James Building, he found Sales Manager E. Meyer in a very optimistic mood and well pleased with prevailing conditions and the indications for the future. The fact that the Edison Company have secured some very large contracts recently gives them a sound foundation for a belief in the general revival of building and construction work. Among large recent orders is one of 125,000 barrels of cement to be used in the construction of the bridge loop of the subway; also one of 50,000 barrels to be used in the construction of the Bronx storm relief tunnel sewer, which will extend from High Bridge to Webster Avenue. The Edison Company have lately received also an order of 25,000 barrels to be shipped to Buenos Ayres. Mr. Meyer, speaking of the outlook for the future, said: "The conditions which have prevailed for the past few months, during which time the demand for cement naturally decreased, made it necessary for some of the plants to shut down, but now, with a general revival of business it will not be long before the stocks on hand have been sold, and naturally this will also have the effect of raising the price of cement, which is entirely too low at the present time. Another thing to be taken into account when making predictions for the future is the continual increase in the general use of cement. I firmly believe that the total amount used this year will exceed that of 1907."

Charles C. Kritzer of the Kritzer Company, the well-known hydrating machinery manufacturers of Chicago, paid a pleasant call at the New York office of ROCK PRODUCTS last week. The news which Mr. Kritzer had to dispense was almost as agreeable as his own presence, for he had just closed a contract with the Magnesia Company of America and installed a large hydrating plant in their works at Newark, N. J. They will produce a hydrate from the by-products of the manufacture of magnesia. Mr. Kritzer believes that this large order is valuable evidence of the revival of prosperity generally. A large hydrating plant now being installed at Yorktown Heights, N. Y., for Lowell M. Palmer, the well-known lime manufacturer, whose office is at 149 Broadway, is nearing completion, and Mr. Kritzer says that he thinks the plant will be in operation by February 1. Two Kritzer plants which are under construction for the Castner Electrolytic Alkali Company at Niagara Falls are expected to be ready for use by the first of next month. It is said that this company contemplates the installation of a third plant. It is certain that the pessimist would have a difficult time in entertaining Mr. Kritzer, for he is so busy that he hardly has time to talk anything but business.

According to Mr. Olcott of the Pennsylvania Cement Company, whose office is at 26 Cortlandt Street, the recent increase in the number of inquiries and orders shows that business is rapidly improving. The majority of these come from large contractors, while the number of dealers who are at present interested is not quite so large as at this time last year. This condition, however, is to be expected, because the dealer is possibly the last man to feel the improvement in conditions, and at this time especially he is waiting for a strong demand before placing orders or making contracts. Some possibly are expecting prices to be reduced and are not aware of the general upward trend of the market. "With the natural revival of building in the spring," said Mr. Olcott, "and with the general improvement in financial conditions, it is safe to say that the demand for cement will quickly empty the stock-houses, and those plants which have been forced to shut down will resume operations at an early date." Mr. Olcott does not look for exceeding high prices during the coming year, but thinks that the demand will be steady and conservative, and that in the end the amount of cement used will be even greater than in 1907.

Improvements which have been in progress in the plant of the Pennsylvania Cement Company will be completed in about one month. Among these is the addition of a new crusher plant, two kilns 125 feet in length, and a number of storage bins to protect the quarried work from the weather so that there may be no variation in the condition of the material on account of inclement weather conditions. These bins will be constructed to hold at least a week's supply of rock. It is possible that the Pennsylvania Cement Company will lengthen their old kilns and thus increase their capacity to 4,000 barrels per day. The grinding capacity at this time is adequate to take care of this increase in production. The output, when the improvements are completed, will be 3,000 barrels per day. The plant has been in steady operation.

The Ruggles-Coles Engineering Company of 39 Cortlandt Street are among those who believe that hard times are a thing of the past. They have closed orders for a number of dryers in the last two weeks and the prospects for the spring trade are much better than they expected in the light of the conditions of the past few months. I. R. Coles is firmly of the opinion that business generally will continue to improve.

The Palmer Lime and Cement Company, 149 Broadway, report a great increase in the number of inquiries and orders since the first of the year, and, while it is yet too early for things to take effect in their line, they can plainly see that spring business conditions will be perfectly satisfactory.

E. G. Thomas of the Aero Pulverizing Company, 82 Wall Street, is in Camden, N. J., supervising the installation of some of their machinery. This company are busy on orders which have been coming in steadily. The Aero pulverizer has attracted wide attention from manufacturers of cement throughout this and other countries, although it is comparatively a new thing.

E. A. Westerfield, sales manager for the Anderson Foundry and Machine Works, 39-41 Cortlandt Street, was found ready to add his part to the evidence showing a general revival of business. The company manufacture sand-lime brick and block machinery and also make tube mills, pulverizers, dryers and equipments for mining and quarrying plants. Mr. Westerfield said that the months of October, November and December were about the dullest they have ever experienced, but that there had been a surprising improvement since the first of January. Last year the company's business was, as a whole, eminently satisfactory, and a large number of sand-lime brick plants were installed in various portions of the country, in addition to much work done in their other lines. They found it necessary some time ago to discharge some of their employees, but have recently taken them all back and are now running to full capacity.

There is certainly a keynote of prosperity in the information derived from a conversation with Mr. Abbé, of the J. R. Alsing Engineering Company, whose offices are at 36 Liberty Street. Speaking of conditions in their business Mr. Abbé said: "We have not noticed any change in our business throughout the whole financial depression. It looks as if we are an exception, because we hear and read of firms complaining of the decrease in business. We have had a large order from the Tonopah Extension Company for the largest size tube mill that was ever built, and have orders from another large mining concern to design the same style of mill, but in still larger sizes. We have orders for two 5'x22' tube mills from the International Sand-Lime Brick and Machinery Company; one smaller size for the Earth Products Company of Chicago; also one small-size pulverizing cylinder and a pair of crushing rolls for the Cutler-Hammer Manufacturing Company in Milwaukee; two small-size tube mills for the Pittsburgh Elastic Enamel Company; one No. 2 pulverator for the Elcessor Stucco Retarder Company, Braddock, Pa.; one small pulverator for the Eastern Finishing Works, Lawrence, Mass., and the usual amount of orders for supplies from the old trade, and, lastly, an order for our latest type of tube mills from the South Dakota State School of Mines, Rapid City, S. D. We are very much pleased with this last order, because it proves that our latest type of tube mill, with the patented driving system, by which we can save 50 per cent of the power over other tube mills, must have proved to be the best after a careful investigation by the South Dakota school officials."

The Consolidated Engineering and Construction Company has been organized with a capital of $100,000. The directors are J. William Russell, John F. Phelan and M. R. Seaber, with offices at 1 Madison Avenue.

The Keystone Construction Company is among the latest incorporations. Mortimer C. Rosenbaum of 119 East Seventy-eighth Street, Maurice H. Rothchild, 25 East Ninety-ninth Street, and Samuel L. Waller, 124 East Ninety-first Street, are the directors. The capital stock is $6,000.

According to a statement issued by Thomas D. Fitzgerald, chairman of the legislative committee of the State Workingmen's Federation, organized labor has mapped out an extensive legislative program. Some of the changes in the State laws asked for are: A constitutional amendment making employers responsible for loss of health or death through unsanitary conditions of workshops, factories or other places of employment; increases in the amounts of indemnity under the employers' liability act; ten days' vacation with full pay each year for laborers employed by the city of New York (Mayor McClellan vetoed such a bill last year); weekly payment of all railroad employees (a bill providing for payments semi-monthly was defeated at the last session); a minimum wage of 25 cents per hour for unskilled labor.

BUFFALO, N. Y.

BUFFALO, Jan. 20.—Lewis Belger, contractor and builder, has bought the Akron (N. Y.) Cement Works from Thomas B. Lockwood. The works have not been used for some time.

Representative Porter has introduced a bill at Washington appropriating $150,000 for the construction of a Federal building at North Tonawanda, N. Y.

A Canadian report says that Regina, Can., issued in 1907 489 building permits, covering $1,770,840 worth of buildings, and that Lethbridge, Can., put $225,000 into buildings, not including its C. P. R. works, which would bring the amount to $500,000.

John Nolan, a Schenectady (N. Y.) contractor and builder, recently filed a bankruptcy petition showing liabilities aggregating $10,553 and assets $11,200.

According to official figures showing the trade of Buffalo last year the cement shipments from this port gained about 1,500,000 barrels.

According to statistics issued by Henry Rumrill, Deputy Building Commissioner of Buffalo, there were thirteen more building permits issued in this city in 1907 than in 1906, or a total of 2,880, aggregating $8,452,400, against $8,686,000 for 1906.

There were 1,929 building permits granted in Rochester, N. Y., last year, aggregating $6,752,615, an increase of $577,186 over 1906.

According to a report from Port Colborne, Ont., the Stinson-Reeb Builders' Supply Company of that village, which handles the products of the Imperial Plaster Company of Toronto, Ont., has just completed the erection of a thoroughly equipped plaster mill.

SYRACUSE, N. Y.

SYRACUSE, N. Y., Jan. 15.—The report of the Superintendent of Buildings for the year 1907 shows that a larger number of buildings were erected than in any other year in the history of the city. The total number was 1,299, as compared with 1,055 in 1906. The total cost in 1907 was $4,222,282, as compared with $3,313,261 the previous year. For new buildings, with 687 permits, there was spent $3,466,640, as compared with 590 permits and $2,925,676 the previous year. The brick, stone, concrete and steel buildings cost $1,720,196. The largest single item in this was $350,000 for the Syracuse University Stadium.

The city also broke the record for cement sidewalks, the amount laid being 37.3 miles, costing $50,442. In 1906 the cost of walks was $32,643. During the year three miles of pavement was laid, at a cost of $154,743, against 3.15 miles in 1906, at a cost of $263,217. The amount spent for sewers was $43,145, which is $37,091 less than 1906.

A section of the Paragon Plaster Company's works at West Fayette and Magnolia Streets was destroyed by fire January 3, and the loss was estimated at $25,000 to $30,000, all covered by insurance. The part destroyed, which was used mostly for the making of Paragon plaster, will be rebuilt at once, and in the meantime the company has arranged with its Buffalo plant to fill all orders. Former Mayor Jacob Amos is president of the company, and W. K. Squier is treasurer and manager.

At the annual meeting of the Canal Quarry Company the following directors were elected: Joseph Dunfee, president; Isaac H. Monro, vice-president and treasurer; S. G. Schlachter, secretary.

At a special meeting of the stockholders of the Solvay Process Company it was voted to increase the capital stock from $6,000,000 to $8,000,000; the money will be used for making the necessary improvements to the big plants of the concern at Solvay and at Detroit, Mich. All the stock will be subscribed by the present stockholders.

CHICAGO

CHICAGO, Jan. 21.—As may be expected, there is very little doing in the building-material line. This is the month when most of the fraternity take a vacation, and many are away now. The extreme cold weather has stopped all operations in the building line—that is, on outside work. Interior work, such as plastering, continues so that the buildings that are now in course of construction may be ready for occupancy by spring. It is the consensus of opinion among the material men and manufacturers that this will be a good year, taking all conditions into consideration. The recent money flurry is well over, and confidence has been restored to the entire country. Wild-cat or speculative building will undoubtedly be held in check this year and a more conservative condition prevail. It is certain that the building that is done will be of a more substantial nature and the money appropriated will be forthcoming when needed.

There are a few large buildings in sight already, though it is early yet. Plans for one large building are now out. Architects Holabird & Roche are receiving bids for a seventeen-story building for the estate of L. J. McCormick. It is to be on the corner of Michigan Avenue and Van Buren Street, 126 by 172 feet, to cost $1,000,000.

Sales Manager Moats of the Austin Manufacturing Company reports that the demand for crushing machinery has picked up in the last few weeks, although it was very quiet previous to that time. They have taken several orders lately for Austin crushers, among others from Doolittle & Wilcox, Dundas, Ont., for a No. 8 crusher and equipment for same; the Tennessee Coal, Iron and Railroad Company, Birmingham, Ala., two No. 8 crushers; one No. 6 crusher for the new plant of the Altoona Portland Cement Company at Altoona, Kan. Mr. Moats said that they expected a fair season and believe that general business condition will be good during the year.

Everett Hotchkiss of the Hotchkiss Concrete and Sand Company has retired from that concern and is now engaged in the sand and gravel business of the General Concrete Company of Houston, Tex., having charge of their plant. William S. Hotchkiss is now general manager of the local company, and is making plans to extend operations both in the sand and gravel line, as well as in the concrete department. They will put into their plant at Warrensville machinery for handling large quantities of sand and gravel each day.

The Marquette Cement Manufacturing Company, through their general sales agent, William Dickinson, have recently closed the largest contract in the history of their business. It is through the Milwaukee Cement Company of Milwaukee, Wis., to the Newton Engineering Company of Milwaukee. The last-named concern has been awarded the contract for the construction of a reinforced concrete viaduct across the Menominee Valley at Grand Avenue in Milwaukee. This viaduct is to cost $370,000 and will contain the longest concrete spans of any viaduct or bridge in this country. Fifty thousand barrels of Marquette cement will be used in this job. The Marquette Company have recently closed a contract also for the Minnehaha Falls river improvement at Minneapolis. This concrete work will require 10,000 barrels of Marquette cement.

Milton J. Williams, sales manager of the Williams Patent Crusher Pulverizer Company, says that the cement machinery line business has picked up considerably since the first of the year, although their out-of-town collections are rather slow. They have in a few orders for their grinding machinery from several large plants in different parts of the country.

Charles H. Wood, sales manager of the Wolverine Portland Cement Company, says that, although it is a little early in the season to make any statement on the outlook, he believes the cement business this year will be fairly good. The increasing consumption of Portland cement is keeping all the mills busy, and he looks for good business for his company.

John J. Maroney of the Marquette Sand-Lime Brick Company says that since the convention the outlook for the sand-lime brick business showed considerable improvement. He believes that there will be a number of new plants put in this year and that the industry will show a decided gain over last year's business.

A. T. Howe of the Marblehead Lime Company said that the lime business at the present time was rather quiet, although he believes that it will be good this year and that building operations will be more conservative than they have been. While there will not be as many large buildings, there will be a substantial increase in the number of small ones.

At the Chicago office of the Atlas Portland Cement Company they are taking things a little easier than they generally do at this office. They are beginning to take orders for spring delivery and believe that the outlook for the cement business is very good.

The Chicago office of the Power and Mining Machinery Company has closed a contract with the Kinsley Construction Company of Ft. Edward, N. Y., for two No. 7½ McCully crushers and complete equipment for a crushing outfit. They report that orders have been coming in in the last few weeks in good shape, and they anticipate a good season in cement and stone-crushing machinery.

The Interstate Equipment and Engineering Company, whose office is in the Old Colony Building, are very busy these days. Manager H. O. Conklin says that business is good and the outlook, judging from the inquiries which are coming to them from all over the country, even better, especially as regards concrete construction. The Interstate Company have just taken the sole agency for the Vanguard gasoline and alcohol locomotive. Mr. Conklin is enthusiastic over this little giant newcomer in the traction field. He says that motor-driven locomotives are the thing and that the Vanguard has come to stay.

George C. Marsh of the Contractors' Supply and Equipment Company reports that the demand for Smith mixers is as brisk now as it ever was in 1907, and that means a great deal, for Mr. Marsh is not given to exaggeration. The company also report a general increase all along the line in inquiries and orders for their various specialties, including the Symonds crusher.

LOUISVILLE, KY.

LOUISVILLE, KY., Jan. 15.—While the present time is one of limited activity in the concrete and allied lines in this city and vicinity the general feeling is growing brighter.

Building operations here were seriously interfered with during the greater part of the past year by labor troubles. Those who postponed the erection of structures then are now likely to have the same go forward with the arrival of spring months. Just now, however, there are very few contracts being let for concrete work. Aside from sewers and minor jobs there is not much activity.

The Kosmos Portland Cement Company have closed down their plant at Kosmosdale for a limited period, and will give it a general overhauling. They report the demand a trifle off, but are looking forward to a good business when the weather becomes more suitable for concrete operations.

J. B. Speed & Co. note a quiet demand for both lime and cement. They have closed down their Portland mill at Speeds, Ind., in order to make necessary repairs. They are making good progress on the new addition to their mill, and expect to be operating it within the next few months.

The Union Lime and Cement Company say that they do not look for any great business at present, and are not alarmed over the outlook for the year, as conditions look rather favorable in respect to building operations.

The Louisville Cement Company have made some changes recently, and the following are now the officers: J. B. Speed, president; W. S. Speed, vice-president and general manager; Henry S. Gray, secretary and treasurer, and T. A. Courtenay, sales manager. They have taken possession of the offices at 247 West Main Street, formerly occupied by the Western Cement Company, and are selling several brands of cement. They expect to push the natural cement industry and have every reason to believe that they will receive their share of the business during the present year.

The National Concrete Construction Company have been awarded the contract for the concrete piles and foundation for the new sub-station of the Kentucky Electric Company, to be erected at Third Street and the river. They are making nice progress on the new reinforced concrete warehouse at Third and Green Streets for the Haldeman Warehouse Company.

The Central Concrete Construction Company have had a good year. They are figuring on some nice jobs, and expect to be quite busy when the weather permits activities in their line.

The Fitch-Trexell Company has made some changes in its organization, beginning with the new year, Charles F. Fitch having left to become interested with Jones & Co. of St. Louis, who have recently secured a contract for a portion of the concrete sewers to be built here. The style of the concern for the present will be E. H. Trexell Company. Mr. Trexell says they are planning some nice work for the present year.

C. S. Hill & Co. have about closed up all their concrete work for the present and are awaiting the opening of spring weather.

The Southern Roofing and Paving Company report business dull in both concrete and roofing and do not expect to do very much until the advent of warmer weather.

The Louisville Pressed Stone Company have just completed the erection of a large factory building of concrete blocks, and are taking things easy during the remaining winter months.

Plans are now being prepared by D. X. Murphy & Bro. for the rebuilding in concrete of the Bourbon Stock Yards, which were destroyed by fire several months ago. The contract will be a large one, in the neighborhood of $200,000.

The Nugent Sand Company has been organized here, taking over the business of W. F. Nugent & Bros. This concern has been identified with the river sand and gravel industry for some time, and they will enlarge their operations. The capital stock of the company is $50,000. Those interested are William F. Nugent, J. R. Nugent and T. C. L. Nugent.

The Atlas Wall Plaster Company have no complaint to make regarding business. They believe that the present year will be favorable and are looking forward to a good demand for plaster.

The Kentucky Wall Plaster Company are keeping reasonably busy, though they have nothing of particular interest to make public just at this time.

The Kentucky Vitrified Brick Company are not as busy as they could wish to be, but are looking forward to an early revival.

The Louisville Fire Brick Works find a little improvement in the demand with them and believe that the present year will bring a very nice business.

The Southern Brick and Tile Company find conditions somewhat favorable with them. They have closed down temporarily, but expect to get things in shape for a good year's run.

The Burrell & Walker Sewer Pipe Company are not rushed, but hope for a resumption soon.

The P. Bannon Sewer Pipe Company find the demand for sewer pipe slow, with the outlook more favorable for the future.

Sam. F. Trexell & Co. say that there is not much doing in the composition roofing industry these days. They expect to be busy later in the year.

NEW ORLEANS.

NEW ORLEANS, LA., Jan. 15.—What wonder is it that reinforced concrete has made such progress here? It is probable that it was here that the first reinforced concrete was used in the United States. That was before Louisiana was a State or New Orleans a city.

When the early settlers landed here they found a cypress swamp where water covered the face of the earth most of the year. Just why they should have chosen this particular site is not plain at this remote day. The tall cypress trees were hung with the long gray moss that reached down and swept the palmettoes below. Of course the pioneers set about building houses. This they did by riving cypress boards, which served for sides and covering of the houses. A little later, as the hamlet grew, more substantial houses were built, and they were nothing more or less than reinforced concrete. There were no steel bars or expanded metal, but wood was used for reinforcement. Skeleton forms were built, and solid walls of concrete were made over these. Possibly no one knows the proportions of sand and shells and gravel or the kind of cement used, but, whatever it was, it formed a concrete that is hard as granite and even more lasting. Hundreds of those early houses are standing today. One of the concrete block factories is in a building of this early concrete, and it stands as a mute champion of reinforced work.

Warner & Co. have established a factory at Broad and Toulouse Streets, where they have installed Fisher hydraulic hollow concrete block machinery that is turning out some splendid work. Washed gravel and crushed limestone is used in this work, and the samples shown of seasoned work bear out all good things said of it. The factory, although new and as yet on a comparatively small scale, is very complete. Electric machinery is used, and a tramway serves to carry the car of completed blocks to the seasoning-sheds. The company is busy, having several good contracts to fill.

The Hollow Concrete Block Company, which also has its factory on Broad and Toulouse Streets, is working a large force of men turning out hollow blocks for dwellings, churches and walls. The company's calendar for 1908 shows a stunning young lady who is praising her new hollow concrete block house.

The cement dealers are having considerable trouble in getting all the cement necessary for the many con-

tracts calling for it. F. Codman Ford, dealer in builders' specialties, among which is Universal Portland cement, says: "We are having no end of trouble getting cement and other materials, owing to the car-shortage. Yes, and we will continue to have it until we get fourteen feet of water and a $50,000,000 appropriation for the Mississippi and our inland waterways."

It would be difficult to estimate how many barrels and sacks of cement are used here daily. There is scarcely a building of any kind that has not cement or concrete used about it. All the work by Stewart & Co. has more or less concrete in the construction. For example, there were the Illinois Central wharves and docks, costing away into the millions and largely built of reinforced concrete. The slips, wharves, docks and elevators of the New Orleans Terminal Company will be all of concrete when completed. The American Sugar Refinery at Chalmette has also a large proportion of concrete work. The passenger station of the New Orleans Terminal Company has reinforced concrete foundations and floors.

George J. Glover, a local contractor, put down the foundations of the Greenewald Hotel, one of the new skyscrapers, and is to put in the foundation of the Monteleon Hotel and other big buildings that will be erected during 1908. The specifications call for pine piling, capped with concrete, and concrete basement walls and concrete fireproofing, and in most instances concrete floors.

Among the new contracts to be let soon are: The Richardson Memorial Medical Building, Audry & Bendernagle architects; Delgado Hospital, Crosby & Henkel architects, and Turo Synagogue, Emile Weil architect.

Among the large buildings in course of construction or for which the contracts have been let are the Audubon, a million-dollar hotel; the Courthouse; the Monteleon Hotel; the Carnegie Hotel, and the Masonic Temple.

Mr. Frederickson, chief engineer for James Stewart & Co., in speaking of the amount of concrete used in some of the work under construction, said: "In the New Orleans Terminal Company's passenger station we will use 4,000 or 5,000 cubic yards of concrete in the foundation and sidewalks. There is to be a concrete dome over the main reading-room; concrete footings on the piles, and the basement under part of the building will be concrete with floors reinforced with rods to overcome any upper pressure of water. The Maison Blanche has concrete foundations on piles reinforced with steel beams. There were 3,500 piles driven down, and on these rests the reinforced foundation. The floors throughout the building are reinforced concrete, also the roof, which together will cover a space of 500,000 feet." The principal brands of cement used are Vulcanite and Atlas. Small amounts of Universal and Lehigh cement have also been used. The total will used comes from the Alabama quarries and the gravel and sand from Prophet's Island, in the Mississippi River, and from the Tchefuncta River. In the foundation work the concrete is crushed limestone and gravel, and in the reinforced floors and roof cinder concrete is used. There is a basement under a portion of the building and a large tank, both of which are reinforced concrete.

The corner stone of the big million-dollar Courthouse was laid January 8, "Jackson Day." It was a great day—a day marking the line of division between the sentimental past and the push and progress of today. It marked also a new era in building, being a strong indorsement of the adaptability and worth of reinforced concrete in large and costly buildings as well as in the modest dwelling or store building. While the exterior of the Courthouse is of white Georgia marble, the foundation and framework are of reinforced concrete.

The main construction of the Public Library, which will cost $250,000, is of concrete. The ground plan is 99.9x168. The erection of this building has been watched with much interest. It is on the site of the old Masonic Temple that was built in 1865. It had a deep brick foundation which had to be blasted out before the work of constructing the new building was begun. Enough brick was taken out for all the footings and walks and 100 yards or more left. After the bricks were taken out 375 Raymond concrete piles were put down twenty feet below the foundation walls. On top of these piles there is a concrete base for footing on which rests the superstructure, the stone and brick walls. The entire basement floor is of concrete. Broken brick taken from the old foundation was used instead of gravel or crushed stone. The entire steel frame is inclosed in cinder concrete reinforced with expanded metal and half-inch lug bars two feet on centers, in spans over seven feet long. The entire roof, including flat portions, mansard pitch and domes, is covered with cinder concrete reinforced with expanded metal furnished by the General Fireproofing Company of Youngstown, O. The mansard is covered with slate nailed to the concrete with galvanized roofing nails. This is a very unusual method and is the first of the kind in the city. Each dome is covered with handsome embossed copper, 16-ounce hard-rolled. The steel frame was from the American Bridge Company. The dome and trusses were very difficult to erect, but are artistically done. The plastering in this building alone will cost $24,000. The plaster is furnished by the Texas Cement Plaster Company. There has been used in the building 1,200 barrels Old Dominion Portland cement, supplied by the Carolina Portland Cement Company.

Moise H. Goldstein, who returned from Europe some time ago, has allied himself with Diboll & Owen. The firm name is now Diboll, Owen & Goldstein. He says there is more reinforced concrete work being done in Europe than in this country.

There is much concrete work in progress within a radius of 100 miles of New Orleans. At Hattiesburg, Miss., the contract has lately been let for the construction of three concrete bridges. Bowstring girders and Kahn bars will be used. The Ross office building at Hattiesburg is another good piece of concrete work. It is 60 by 90 feet, five stories high above the basement. MacKenzie & Biggs were the architects. The same firm have had their plans accepted for the erection of a fireproof reinforced concrete dairy barn at Jackson for the Louisiana State Insane Asylum. The building is 60 by 140 feet and made to accommodate 100 cows. All the floors, beams and columns are concrete. It is modern in every detail. The individual stalls are separated by pipe bars. The feed-troughs are of concrete. Kahn cup bars are used throughout for reinforcing. One of the features of the building is that the walls are only four inches thick, reinforced with rods to make them very substantial. Both Lehigh and Kosmos cement are used, furnished by the Carolina Portland Cement Company of this city.

THE TWIN CITIES.

MINNEAPOLIS, MINN., Jan. 15.—Business conditions show a strong tendency to return to normal, and the fact that the banks of the Northwest are now on a cash basis gives impetus to this movement. The Northwest as a whole is in the best of shape. Bank deposits have gained steadily, and clearings are larger than ever. The crops for the three States of Minnesota, North and South Dakota are estimated to be worth $60,000,000 more than last year's. And as the crops are needed in the markets of the world they will bring their value whenever they are marketed.

In building and construction lines cautious experimental steps are being taken toward resuming building activities, and the fact that prices on materials are lower and deliveries are prompter and surer should have great weight toward encouraging a better movement along this line. Labor is somewhat lower also, although there is a strong inclination to fight off any admission of this on the part of organized labor. This latter is the one factor which may serve to depress an otherwise encouraging and optimistic condition. There is an undercurrent of rebellion in the ranks of organized labor in the Twin Cities. The plumbers in Minneapolis have been working under the open shop, having been defeated in a square contest upon that issue several years ago. But it is understood that the men have been quietly organizing the workmen and expect to feel strong enough to resume the contest in time. Other trades which have tacitly accepted open shop conditions are grumbling, and there is talk of starting trouble in the spring. Duluth, which is a hotbed of unionism, is undergoing a contest on the open shop proposition.

M. S. Detweiler, a well-known architect of Minneapolis, died recently after an illness of several months. Mr. Detweiler was until a few months ago a member of the firm of Bell & Detweiler, who have had several good-sized public buildings in the Northwest, including the State Capitol at Pierre, S. D., now under construction, and the Courthouse at Fairmount, Minn., just completed. Other work in which he was interested includes courthouses at Vinton, Ia.; Elbow Lake, Minn.; Deadwood, S. D., and Britton, S. D.

R. F. Jackson, of the building material firm of Johnson & Jackson, Minneapolis, has been on an extended trip through the East, visiting the different plants whose goods are carried by his firm.

Carney Bros., of Minneapolis and Mankato, have opened a downtown office in Minneapolis at 408 Lumber Exchange Building. They handle lime, cement, plaster, etc.

The Nodamp Machinery Company of Minneapolis has recently been incorporated as a reorganization of the Nodamp Company. The capital stock is $50,000 and the incorporators are Joseph T. Thurman, Frank W. Tidball and David J. Ames.

Harold Johnson of Minneapolis, Northwestern representative of the National Fireproofing Company, recently took the contract for furnishing all the hollow tile fireproof work for the new building for John W. Thomas & Co., in course of construction at Eighth Street and Nicollet Avenue. There will be 80,000 feet of floor space in the five floors, and the work will require a total of eighty carloads of material. Short-span arches in 12-inch, web-shaped, will be used. They will come from the company's factory at Ottawa, Ill.

Minneapolis building permits for 1907 passed all previous records, the total being $10,006,485, exclusive of plumbing, heating and wiring work.

Minneapolis laid brick paving last year to the value of $48,000, sandstone for $37,000, granite for $29,000, macadam $2,100, and creosoted block for $287,000. All work is laid on a concrete base, however.

Thomas Fitzpatrick, head of the general contracting firm of Fitzpatrick & Son, St. Paul, died December 31, aged 75. Mr. Fitzpatrick built many of the older buildings in St. Paul, including the old Postoffice, the Mannheimer Building, the Merchants' Hotel and St. John's Church.

Henry Brown, formerly of the general contracting firm of Brown & Dowling, St. Paul, died recently, at the age of 61. He left a widow and four children.

The Minnesota State Railroad and Warehouse Commission has decided, in the question of switching charges at New Ulm, Minn., on stone, that the Chicago & Northwestern may exact a charge of $5 a car from the quarries to the city and to the Minneapolis and St. Louis connection. A rate of $3 a car is made for stone to the city intended for city use. These rates are to apply to carload lots, regardless of weight.

William A. Elliott has been reëlected president of the Minneapolis Builders' and Traders' Exchange, having no opposition. The exchange had a total of 465 sets of plans on file for figuring during the past year, the work aggregating in value about $3,000,000.

St. Paul's building total for 1907 aggregated $8,057,000, which was a decrease from the year before of about $300,000. The prospect for the coming year is very good, however.

Minneapolis erected forty-six fireproof buildings during 1907, some of reinforced concrete, and others of hollow tile and other construction. Thirteen others were fireproof except the roofs.

CLEVELAND AND NORTHERN OHIO.

CLEVELAND, O., Jan. 15.—This month has seen considerable improvement in business, and the outlook for a speedy return of normal conditions is bright. Building projects of importance are already looming up. It is generally believed that there will be plenty of money for building purposes during the coming summer, as the banks show big increases in their reports. It is anticipated that interest charges will be low, and with the general slump in the price of building material a revival of trade is looked for. Already some of the architects are preparing plans for projects of considerable importance which will get the supply men busy after orders.

President J. W. Kling of the Cleveland Builders' Supply Company says that he does not look for much of a revival in the cement business until spring. Neither does he look for an advance in delivery prices this summer. With other Cleveland dealers Mr. Kling is inclined to believe that cement quotations will be nearer normal than for several years.

Manager Fay of the Masons' Supply Company declares that cement prices have been too high for the past year or two, and that the temporary depression has had the beneficial effect of bringing them back where they belong. Mr. Fay looks for a good summer's demand for cement products.

Cement is now selling at $1.60 a barrel in small lots and as low as $1.40 in large lots for big contracts. Last summer it sold as high as $1.80 and $2, delivered. It is not believed that it can go any lower. Most of the supply companies are carrying along just enough to meet orders, preferring to stock up with fresh material as building activity is renewed. Production at plants represented in this city is reported as being low.

The Cleveland Builders' Supply Company have just completed the installation of a fine big revolving sand crane at a cost of $10,200.

On March 3 citizens of Cleveland will be called upon to vote on a bond issue of $1,000,000 for sewers and pavements on 206 city streets. It is believed that the money will be cheerfully voted. About $500,000 will be used on the new intercepting sewer.

The Farr Brick Company are busy doubling their capacity in anticipation of a big season's demand for paving brick. Dryers and new mud machines are being installed and other improvements made. John Kline, paving brick manufacturer at Wycliffe, O., is

A new viaduct in which concrete will be extensively used, and for which steel will be employed for the upper frame work, is planned at a cost of $450,000 to join two southern portions of Cleveland now separated by the Cuyahoga Valley. Special legislation is being secured so that the county, State and city may share the expense. Contracts will be let in the spring. County Engineer Lea has prepared the plans.

The mammoth concrete piers for the new 300-foot span of the Nickel Plate Railroad over Rocky River were threatened on January 12 when an immense ice floe crushed down from the upper river bed following a thaw. Workmen labored far into the night to blast a channel through which the ice might pass.

The Election Supervisors have been fighting bitterly a move to cut their appropriation of $7,000 for new concrete voting-booths to $5,000. It is believed that with $7,000 some thirty new concrete booths could be provided. The city already has about half a dozen.

MEMPHIS AND THE SOUTHWEST.

MEMPHIS, TENN., Jan. 18.—The building résumé shows 1907 to have been in point of valuation the best year in the history of Memphis. More attention was given to concrete work than ever before.

The Memphis Granolith Company are making blocks for a number of residences that will be constructed next spring. They report the winter outlook as good.

B. E. Jarratt, manager of the Memphis office of the Weber Concrete Company, says that his company is doing a great deal of chimney work in the South. They have lately been working on some jobs for the Standard Oil Company.

The Memphis Asphalt and Paving Company, Tennessee Trust Building, report the season a little quiet in their line. They have been doing some work at Little Rock, Ark., and are bidding on a large job at Montgomery, Ala. They report business conditions in the Southwest improving.

The Union Sand and Material Company say that the demand for cement is holding up well considering the weather conditions and the financial disturbance. They are working all the time, taking sand out of the river. The sand and gravel trade, just now, they find to be rather quiet.

The Kavanaugh Sand Company also indicate a small decrease in the demand for sand products during the present month and in December. They note a first-class demand from municipal governments and for large public works.

The General Concrete Construction Company, organized here late last year, are planning several residences to be built next spring and in which concrete will play a part.

The Rogers White Lime Company of Springfield, Mo., are erecting a model limeburning plant at the city of Wilson Creek, Mo., which is located on the Missouri Pacific Railroad. C. A. Howell, the company's general manager, is pushing the work to completion, and it will be ready to wait on the lime trade by April. There will be two kilns, each of the capacity of 140 barrels per day.

Crawford & Co., at Aurora, Mo., have increased their concrete block establishment.

PHILADELPHIA.

PHILADELPHIA, PA., Jan. 20.—The cement situation at this time may be said to be rather a hard one, but evidence is slowly creeping in of a more cheerful feeling as to the outlook. Values have reached their lowest mark, and it is realized that to make cement at present figures would mean a loss. Consequently cement manufacturers think it advisable to keep their mills shut down until the spring season opens. There have been numerous newspaper announcements that business is looking up and the mills all starting, but these should be taken with a grain of salt. Some of the cement mills have begun making cement, but only to fill a little void here and there. No concerted action is possible at this time, and stocks are not heavy. Old cement may still hold present prices for a time, but new cement will not be put in the market at such cut-rate figures. The stringent money market seems to be responsible for all irregularities, and it is believed that this calamity will right itself before the spring opens. Concrete construction is becoming more popular every day. It is confidently predicted there will be more concrete buildings erected in 1908 than ever before, all conditions being equal. Lime, firebrick and roofing material are quiet, but dealers in these lines are optimistic as to the outlook when the season opens.

The William G. Hartranft Cement Company, 1112 Real Estate Trust Building, are looking forward to good trading as the season opens and expect values to move upward.

The Alpha Portland Cement Company, 910 Harrison Building, are cheerfully meeting conditions as they come. Henry Longcope, manager, admits things looked blue a few weeks ago, but a reaction has set in since January 1.

The Lawrence Cement Company, 616 Harrison Building, have commenced to make cement, but not to any great extent. L. V. Clark, manager, reports conditions still quiet.

The Whitehall Portland Cement Company, 1722 Land Title Building, are making a little stuff to fill in here and there. H. B. Green, manager, is making an extended Southern trip and will take in the exposition at Buffalo before he returns. His concern will have an exhibit there.

The American Cement Company, Pennsylvania Building, held its eighth annual meeting in Camden, N. J., on January 13. The present board of directors was reëlected for another year. In his annual report President Robert W. Lesley said: "The coming year does not present a brilliant outlook to the cement manufacturers, although we share the hope prevailing among manufacturers in other lines that before spring there will be a general improvement in conditions."

The Chester Stone Company, 324 Land Title Building, report that they have orders now for all the trap rock they can get out.

The Steel Protected Concrete Company, 1618 Real Estate Trust Building, whose work is done on the Wainwright system, report business quiet, as usual, at this time.

On December 26 the Charles Warner Company, Wilmington, Del., increased its capital stock from $1,000,000 to $5,000,000.

The County Valley Construction Company obtained a charter under New Jersey State laws on January 3; capitalized at $125,000.

Albert Hughes, one of the best known builders of Harrisburg, Pa., died on December 31, the last day of his eighty-seventh year. He was born in Philadelphia and came to Harrisburg in 1856.

W. Edward Smith, the well known contractor, died on January 10. He was born in this city in 1833. He built many houses in Philadelphia during his active life and also built the water-works system in Doylestown, Pa.

Caleb Cresson has leased to R. Crosby Fairlamb of P. H. Fairlamb & Co., cement, lime and sand dealers, 115 South Thirtieth Stret, the office and yard adjoining the yard of P. H. Fairlamb & Co., at an annual rental of $3,400. The lot has a front of 94 feet, with a depth of 454 feet to the river.

Henry R. Reinhold, Jr., architect, is preparing plans for a fourteen-room concrete dwelling for Charles R. Hall at Seven-Mile Beach, N. J.

Fred A. Havens & Co. have a contract to build a five-story concrete addition, 20 by 52 feet, to the store building at 300 Market Street, for R. F. Wood. The cost will be $9,000.

THE WEST COAST.

SAN FRANCISCO, Jan. 19.—Comparatively few reinforced concrete buildings are being started at present, although a number are approaching completion. Many new office buildings have been finished, and others will soon be ready for tenants. Unless there is a rapid increase in population not much more office space will be needed during the first half of this year. Reinforced concrete construction is well represented among the largest and handsomest new structures in the city. The architects and construction companies who have erected them may rest on their laurels for a while, as they have had remarkable success and freedom from accidents.

A great deal of reinforced concrete foundation work is still under way and in plan, so that there is still some demand for cement in the building lines. Cement sidewalks have required the use of much cement recently.

Since the first of January there has been an increase of inquiries for reinforced concrete buildings from outside points, where a number of new hotels are projected. Prospective builders have been impressed by the new buildings of this class that have been erected in this city.

The total valuation of buildings for which permits were granted in San Francisco during the month of December was $4,140,000. This increase in valuation of almost $2,000,000 over November did not indicate a great advance in building, but was accounted for by the filing of permits for some very large structures. The total amount of building work initiated during 1907 was $52,292,000 as compared with about $39,000,000 for 1906. The permits issued during April of last year exceeded those of any other month since the rebuilding of the city was commenced. The total amount expended in rebuilding the city since the fire of April 18, 1906, is $85,070,000. More than one-fourth of the 28,000 buildings destroyed have been replaced, and many more are still in course of construction.

In Los Angeles the building reports show a falling-off in number and valuation of construction permits for 1907 as compared with the two years preceding. In 1907 the number issued was 7,700, valuation $13,850,000. In 1906 there were 9,358, valuation $18,502,000, and in 1905, 9,341, valuation $15,615,000.

Swift Bros., who own a mountain composed of lime rock at Scott's Mills, Ore., purpose to build a cement mill costing at least $600,000. A movement is on foot, backed by Frank Robertson of Portland, to raise funds to grade a two-mile spur from the line of the Oregon Electric Company to Woodburn, which will eventually be extended to the proposed cement works.

Major W. H. H. Llewellyn stated at Las Cruces, N. Mex., that he had received assurances from President Roosevelt and Governor Curry that every effort would be made to begin work on the great Elephant Butte dam. The entire project will cost $7,200,000, of which $200,000 has been spent on the Leesburg diversion dam.

The Superior Portland Cement Company.

The Superior Portland Cement Company, whose mill is located at Superior, Lawrence County, Ohio, have been in operation since about November 1, turning out on an average two thousand barrels per day of a high-grade Portland cement. Superior cement is light in color, being the same color as the high-grade Eastern cements, is very finely ground, giving the maximum sand-carrying capacity, and is adapted to

CHARLES SCHMUTZ, SALESMAN.
Superior Portland Cement Company, Charleston, W. Va.

all classes of work, such as reinforced concrete construction, sidewalks, curbs, building blocks, bridge abutments, ornamental work, etc.

The cement which has been shipped has in every instance been satisfactory, and they are receiving many letters of commendation. They have established agencies with the best dealers in their territory, and are looking forward to a large and satisfactory business. Superior cement has been sent to a number of prominent laboratories, for testing purposes, and the company will be glad to send copies of their reports, showing the results of tests, to any one interested. A booklet with full information concerning Superior cement is also ready for distribution.

The Cook & Laurie Construction Company of Montgomery, Ala., who are large railroad contractors, also have sand and gravel pits located at Cooks, Ala. They have twenty acres of land, part of which is under water. The gravel found there is composed principally of quartz. It is pumped from the beds by an 8-inch pump into cars. They ship about eight cars per day from this plant. A ROCK PRODUCTS representative had the pleasure of meeting both Mr. Cook and Mr. Laurie in Atlanta recently, where they have been for some time on the trail of a big railroad concrete job.

Side Talk

A valuable reference book is "Cements, Mortars and Concretes," by Myron S. Falk, Ph. D., instructor in civil engineering at Columbia University. It is an up-to-date compendium of reliable tests made during the past fifteen years, giving the results in tables and diagrams classified according to subjects. This is a reference book that should be in the library of every civil engineer. The contents include chapters on Chemical Properties of Cement, Physical Tests of Cement, General Physical Properties, Elastic Properties in General, Tensile Properties, Compressive Properties, Flexural Properties, Reports on Uniform Tests of Cement by the Special Committee of the American Society of Civil Engineers, and Constitution of Cement. Cloth, 6x9 inches, 184 pages, illustrated. The price of the book is $2.50, and it may be ordered through ROCK PRODUCTS.

F. K. Rhines, Engineer, has become assistant to the Treasurer and General Manager of the General Fireproofing Company (Youngstown, O.), assuming the new position January 1. Mr. Rhines was formerly engineer with the East Iron and Machine Company, bridge builders, at Lima, O., and more recently has been chief engineer and general manager of the Dixon Engineering and Construction Company of Toledo, O.

The sales department of the Power and Mining Machinery Company (Cudahy, Wis.) are steadily extending their field of operations. N. D. Phelps, sales manager of the mining and crushing machinery department, writes ROCK PRODUCTS that they have opened offices in the City of Mexico and San Francisco. The Atlanta and St. Louis offices have been discontinued.

If you are interested in waterproofing and dampproofing, it will be worth the cost of a postage stamp —all that is necessary for an inquiry—to read what the A. C. Horn Company (8-10 Burling Slip, New York) have to say on this subject. Tell them what you want done—what are the conditions—and they will suggest methods and materials that will accomplish the results desired at the lowest cost. During the past ten years they have waterproofed over one million dollars' worth of contracts, and have sold as much material for others to install.

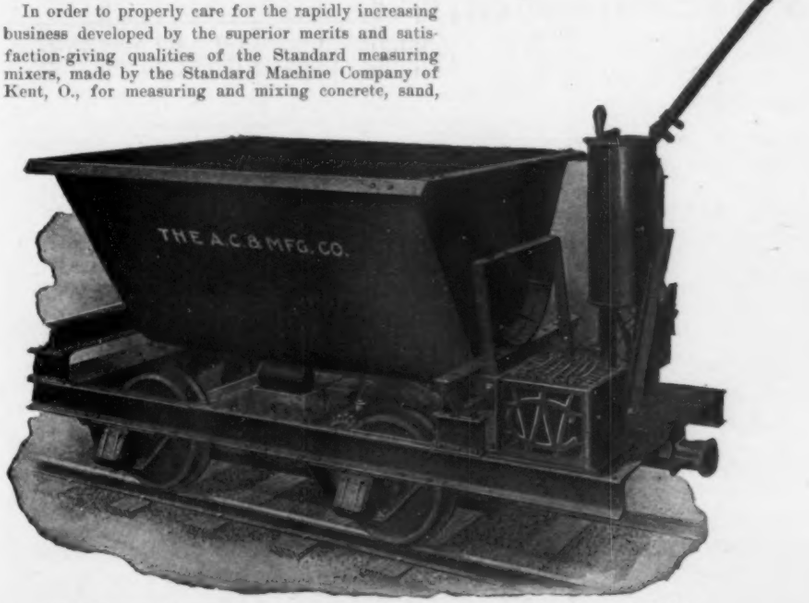
In order to properly care for the rapidly increasing business developed by the superior merits and satisfaction-giving qualities of the Standard measuring mixers, made by the Standard Machine Company of Kent, O., for measuring and mixing concrete, sand, lime and hard wall plaster, a strong company has been incorporated under the name of "The Kent Machine Company." The new company has taken over the entire business of the Standard Machine Company and purchased and newly equipped a large manufacturing plant. As the name "Standard" is used by several other makers of this class of machinery, it has been deemed advisable, in order to avoid confusion, and to have a name more exclusively identifying the product of this firm, to change also the name of their machine to the "Kent" mixers, "Kent" block machines, etc. The product of the new company will include mixers, block and brick machines, cars, and a general line of concrete working machinery.

"Thirty-three years making elevating and conveying machinery," says John P. Lenox of the Webster Manufacturing Company. This concern is one of the oldest in Chicago and the pioneers in this line of work. They have recently installed the elevating and conveying machinery for the Port Huron Cement Company, Port Huron, Mich.

Fred de Coningh of the Sykes Steel Roofing Company says they have recently supplied the St. Louis Portland Cement Company with sheet-metal corrugated roofing and siding for their large plant located in St. Louis. Another large contract was that of the Frisco System freight houses at Springfield, Mo., consisting of general sheet-metal work.

The rapid development of electricity as a motive power in the past decade has brought its use into every class of labor-saving devices. The clay-working industries have been slow in taking hold, but at the present time some large plants are operated entirely by such means. As a flexible and economical motive power nothing is so easily and readily adapted as electricity, and through the introduction of labor-saving tools and being manufactured in large quantities, the cost of electric motors is now brought within the reach of all. Especially is this true of the street-car type of motors, and of many electrically-driven devices may be mentioned brickmaking machinery, pug mills, represses, exhaust fans, transfer cars, winding drums, clay and brick cars, etc. The type of car illustrated herewith is not new by any means, particularly in handling clay, shale, etc., its worth having been demonstrated to a number of concerns as an economical, quick and serviceable car. The Atlas Car and Manufacturing Company (Cleveland, O.) are exclusive manufacturers and make a large line of electric cars as well as clay and dryer cars of all descriptions. Their new catalogue shows a number of up-to-date cars of all types.

The Jeffrey Manufacturing Company (Columbus, O.), whose products are well and favorably known to ROCK PRODUCTS readers, have opened a branch office at suite 924-925, Pierce Building, St. Louis.



ONE OF THE CARS OF THE ATLAS CAR AND MANUFACTURING COMPANY.

Clay Working Machinery
Yard Supplies of all Kinds
CEMENT MIXERS
ELEVATORS
CONVEYORS
DRY PANS
CRUSHERS
BARROWS AND
TRUCKS
Steam or Animal Power Brick Machinery
"MARTIN"
DRAWER 887
LANCASTER, PA.

Peirce City White Lime
PEIRCE CITY WHITE LIME
THE WHITEST, PUREST AND STRONGEST IN THE WORLD
TRADE MARK
MANUFACTURED BY
PEIRCE CITY LIME CO.
PEIRCE CITY, MO.

THE CAPPON PROCESS
(CALCIUM CHLORIDE SYSTEM)
FOR MAKING
Hard Plaster, Artificial Stone and Marble, Etc.
Without the use of gypsum, is of interest to all lime manufacturers
THOMAS W. CAPPON, Patentee
No. 881 E. 141 Street NEW YORK

W. D. MEYER,
Manufacturer of
Marble White Lime
115 Delaware Street, QUINCY, ILL.

A NEW PROFIT MAKER
The Helm Model 5
ONE MAN PRESS
A Low Priced Machine that does all this
Operates TWICE a minute. Five PERFECT bricks each time. Capacity 4,000 to 6,000 daily. None broken, half formed or irregular. All pressed alike face up and easily faced. Uses MEDIUM WET mix and EXTRA COARSE aggregate, making the STRONGEST and CHEAPEST brick. DENSER, HEAVIER and MORE UNIFORM than tamped work.
Produces ANY ORNAMENTAL BRICK any machine will make and RETURNS THE ENDS without shortening the brick. Makes five different rock face designs at once with or without return ends. IT CUTS THE USUAL BRICK MAKING LABOR COST IN TWO AND SAVES CEMENT. Bulletin No. 5 explains these points and many others.
HELM BRICK MACHINE CO., TRAVERSE CITY, MICH.
415 FRONT ST.

THE TEMPLE-INGERSOLL

"ELECTRIC-AIR" ROCK DRILL

Each Electric-Air Drill goes out under a contract entailing no obligation for acceptance upon the purchaser, and allowing a 30 day trial period. Each Electric-Air Drill is guaranteed to do as much work as a standard air drill of equivalent rated capacity, with a saving of at least one-half the power.

Where electric power is available and cheaper than steam power, due to high fuel cost; where high altitudes impair the efficiency of the ordinary air compressor; where long pipe lines would be involved in an ordinary air drill plant; where only a few drills will do the work; these are the places where the Electric-Air Drill offers the best combination of maximum work output at minimum cost. Other conditions, too, may arise which, when examined in the light of the Company's experience, will recommend the new drill over the old standard air drill.

AIR COMPRESSORS **CHANNELERS** **AIR TOOLS**

INGERSOLL-RAND CO.

Chicago, Birmingham, Cleveland — Philadelphia, Houghton, Mich., San Francisco — **11 Broadway, NEW YORK** — Butte, Seattle, Denver — St. Louis, Pittsburg, Los Angeles — El Paso, Boston, Salt Lake

R. 36

NINTH ANNUAL MEETING

National Builders' Supply Association

February 4-5, Auditorium Hotel, Chicago.

ROCK PRODUCTS is the Official Organ.

Improved Utica Hydraulic Cement

The finest ground and highest grade Natural Cement manufactured in the U. S. Every car tested by Robt. W. Hunt & Co., and their test furnished on every car shipped.

MEACHAM & WRIGHT CO. Sole Agents, Chicago.

SNOW WHITE TRADE MARK

A Cement of Quality

BERKSHIRE WHITE PORTLAND CEMENT

31 Park Place, New York City

Thirteen acres of the floors of the Wonderful City Investing Building now being laid with Berkshire "Snow White" Portland Cement, 500,000 square feet of floors.

SNOW WHITE TRADE MARK

Born White

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Advertisements will be inserted in this section at the following rates:

For one insertion.....25 cents a line
For two insertions.....50 cents a line
For three insertions.....60 cents a line

Eight words of ordinary length make one line. Heading counts as two lines.
No display except the headings can be admitted.

Remittances should accompany the order. No extra charges for copies of paper containing the advertisement.

EMPLOYEES WANTED

COMPETENT SALESMAN

Wanted: one who is thoroughly experienced in the stucco and mixed goods market, energetic and can sell goods. A1 references. State salary. Address "BOX 134," care ROCK PRODUCTS.

CEMENT SALESMEN

wanted with established trade in Indiana, Illinois, Ohio and Kentucky.
Address J. O., care ROCK PRODUCTS.

EMPLOYMENT WANTED

PRACTICAL QUARRYMAN

wants position either as superintendent or general manager. Can handle men and get business. Highest possible testimonials furnished.
Address JOHN W. PAIN, Waverly, Ia.

AGENT AND DISTRIBUTOR

wants to represent lime and cement mills that can ship and sell their product in the Louisville, Ky., market.
Address KENTUCKY, care ROCK PRODUCTS.

SITUATION WANTED

with a Portland cement concern by an aggressive young man, who has had experience as traveling salesman and sales manager. Personally acquainted with large trade in the East, as well as the Central West. First-class references. Address C. M., care ROCK PRODUCTS.

SITUATION WANTED

As superintendent of factory making concrete machinery or concrete products. Adress "BOX 5," care ROCK PRODUCTS.

SITUATION WANTED

As sales manager or traveling salesman. Small salary with commission. Address "C. E. S.," care ROCK PRODUCTS.

MACHINERY FOR SALE

CRUSHER FOR SALE.

Gates No. 4 Gyratory, in fine condition. Cheap.
R. P., BOX 2, Sta. A., Cincinnati, O.

ENGINES AND BOILERS FOR SALE.

Engines—Corliss, Automatic and Throttling, all sizes from 1 to 500 H. P.
Boilers—Horizontal, Portable and Vertical, all sizes from 1 to 200 H. P.
Pumps, Heaters, Tanks, Sawmill and General Machinery.
Write for our prices on your requirements.
THE RANDLE MACHINERY CO.,
1745 Powers St., Cincinnati, O.

COMPRESSOR, DRILL, ETC.

One 540-ft. McKiernan compressor.
Two 3¼ McKiernan drills.
One No. 4 Austin crusher with elevator, boiler and engine. EDWARD HELY, Cape Girardeau, Mo.

MONTHLY BULLETIN

of the
INTER-STATE EQUIPMENT AND ENGINEERING CO.
We offer for sale:

1 complete Crushing Plant (7½ and 5), Austin Gyratory with power, new.
1 No. 5 Gates, K, practically new.
1 No. 4 Gates, B, elevator and screens.
1 No. 4 Gates, B, without screens.
1 No. 3 Comet Gyratory.
1 No. 4 Austin Gyratory.
1 No. 2 Gates.
1 10x18 Blake Jaw Crusher.
1 No. 40 Western Jaw Crusher with power, elevator and screens.

Write for prices.
LET US KNOW YOUR REQUIREMENTS.
We install plants when desired.
INTER-STATE EQUIPMENT & ENGINEERING CO.,
Old Colony Building, Chicago.

CRUSHER, ENGINE AND BOILER

For sale. No. 6 Gates crusher, engine and boiler complete, in No. 1 condition. Now in operation but too small for present use.
AMERICAN LIME & STONE COMPANY, Tyrone, Pa.

FOR SALE.

New 9x14 Vulcan dinkies at	2,500.00
New 10x16 Vulcan dinkies at	3,000.00
New 1-yd. clam shell bucket (for sand)	375.00
Lidgerwood No. 71 hoist, complete	800.00
Little Giant 1¼-yd. traction shovel	3,250.00
No. 2 Smith mixer, engine and boiler on wheels.	675.00
Marion Model 60 shovel (new)	9,400.00
Bucyrus 70-ton shovel (new)	9,900.00
New 10-ton American Tandem roller	1,500.00
54x54x16-ft. stone planer	950.00
Gates No. 5 gyratory crusher	850.00
Sullivan channeling machine (new)	1,900.00
6x10 Vilter belted compressor, 34-ft.	110.00
12x12x14 Hall air compressor	650.00
12x12¼x14 Ingersoll compressor	725.00
Morris No. 10 D. C. pump and engine	500.00
Channon full-circle 1½-yd. excavator	4,000.00

Let me have your inquiries for Cableways, Cars, Rail, Rock Drills, Channelers, Traction Engines, Graders and Contractors' Equipment generally.
WILLIS SHAW, 171 La Salle St., Chicago, Ill.

MACHINERY WANTED

GATES OR AUSTIN CRUSHER

wanted, either No. 6 or 7½; must be good condition and price right.
Address "KANSAS," care ROCK PRODUCTS.

PLANT FOR SALE

LIME KILNS, EQUIPMENT

and quarry for sale. For particulars address
CLEARWATER LIME CO., LTD.,
Orofino, Ida.

BLUE LIMESTONE QUARRY

for sale, full equipment, except 125 yard jaw crusher leased at Ludlow Falls, O., on Big Four and C., H. & D. Railways. Only Ruble Stone Quarry operated there. Good trade worked up. All Riprap sells to the railroad company. Address J. L. RECK, Mendon, O.

FOR SALE.

The plant and equipment of the Waterproof Concrete Block Company, 1226 Foster Ave., Chicago, is offered for sale on attractive terms. Located adjacent to C., M. & St. Paul tracks in center of a large North Side building district. Property adjoins building material yard and consists of manufacturing shed, 2 Ideal machines, ball sill and cornice molds and Chicago Concrete Mixer. Company put up six stores, a garage, fence and Government Post Office this year. Company incorporated and doing good business, but other interests make sale necessary. Golden opportunity for practical cement men.

BLUE LIMESTONE QUARRY.

Eighty acres patented, rich in lime, 98½ per cent calcium carbonate. First-class location for an up-to-date lime plant. One large building. The grading for side tracks completed. Northern Pacific Railroad running directly through the property. The demand for lime is great; a fine opportunity for one acquainted with the lime business. For further particulars, address
B. F. FORBES,
Box 207, Boulder, Jefferson Co., Mont.

ENTIRE CRUSHING OUTFIT

for sale in good condition and but slightly used; capacity about 450 tons per day. Will sell intact or will dismantle and load on cars as a whole or in part:

1 No. 12 "Acme" Jaw Crusher.
1 No. 92 "Acme" Jaw Crusher.
1 No. 4 "Austin" Gyratory Crusher and necessary accessories.

Full details given upon application.
Address J. X., care ROCK PRODUCTS.

BUSINESS OPPORTUNITIES

BRIGHT, ENERGETIC

and practical man of experience in manufacturing and selling cement products can secure a fine position with one of the best concerns in the West, located in a city of 50,000 and growing rapidly. Paid up capital and surplus, $30,000. An opportunity to invest $5,000 to $10,000 capital will be given to right man. Net earnings for three years past have been very large. Increasing right along. We need more capital to still further develop and extend the business.
Address C. S., care ROCK PRODUCTS.

MISCELLANEOUS

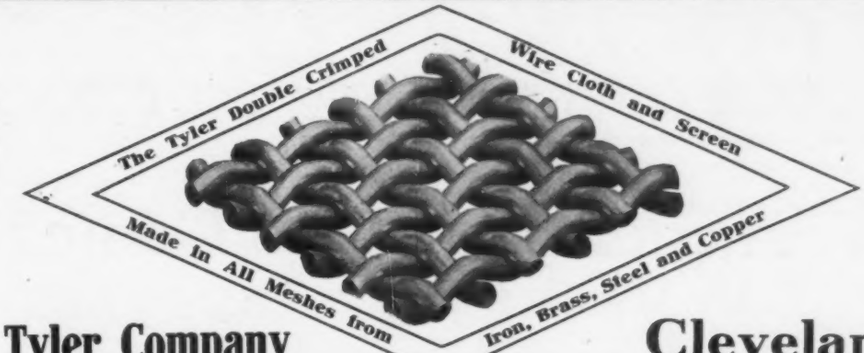
WANTED.

One New Albany Derrick Power; one Atlas Engine, about 30 H. P.; one 80 H. P. Boiler. Must be in good condition. Address
THE CONSOLIDATED STONE CO.,
327 Monadnock Bldg., Chicago.

CEMENT WORKERS EVERYWHERE.

We want you to know we make White Metal Letters and Figures to stamp impressions of names or numbers in soft concrete sidewalks. Also Brass Letters or plates to imbed in cement sidewalks, curb, blocks, etc. Send for price list.
H. W. KNIGHT & SON,
Box R, Seneca Falls, N. Y.

The Tyler Screen is especially recommended for screening stone, sand, gravel, cement, lime, etc. It will stand extraordinary wear.



If you wish some clear, concise data on screens and their uses, send for catalogue "R. P." today.

The W. S. Tyler Company **Cleveland, Ohio**

NOTICE

TO THE

CEMENT TRADE

The North American Portland Cement Company announces to Portland cement manufacturers and to the trade generally that it controls the

HURRY and SEAMAN and the CARPENTER PATENTS

covering the burning of cement with **pulverized coal**

It also controls the

EDISON LONG KILN PATENTS

covering the use of the **modern long kiln.**

Among the present licensees are the following companies:

ATLAS	*AMERICAN*	*DEXTER*	*EDISON*
LEHIGH	*VULCANITE*	*PENNSYLVANIA*	*CATSKILL*
ALPHA	*LAWRENCE*	*WHITEHALL*	*BUCKHORN*
NAZARETH	*BATH*	*GLENS FALLS*	*NORTHAMPTON*
PHOENIX		*PENN-ALLEN*	*LOUISVILLE*

Other applications are under consideration.

For a limited period, the North American Portland Cement Company will, on liberal terms, grant liscenses and releases for past infringement to exsisting and properly equipped cement plants.

All companies using pulverized coal or long kilns in infringement of the above mentioned patents will be vigorously prosecuted. Suits for that purpose will shortly be commenced.

North American Portland Cement Co.

30 Broad Street, New York

CONCRETE BLOCK MAKERS: Notice

The Latest PNEUMATIC PLANT Up-to-date

FOR OPERATING 1 PNEUMATIC CONCRETE BLOCK RAMMER
THE MOST COMPLETE AND COMPACT PLANT IN THE WORLD

This cut shows our "Granite Combination Plant," which is recognized as the finest and best Plant in the world, and has no equal for capacity, durability and completeness.

The Pneumatic Rammer for tamping Concrete Blocks is fast coming into general use, as it is a labor and money saver; besides, it makes a better and firmer block. A workman, with a Pneumatic Rammer, will do from five to six men's work every day under the old hand tamping. Every manufacturer of Concrete Blocks should have a Pneumatic Plant and Rammer.

We will furnish dealers complete Plants, consisting of Pneumatic Plant, with Engine or Electric Motor, Pneumatic Concrete Rammers, and 25 or 50 feet of Hose, which comprises a complete outfit. We furnish Plants, capacity from 1 to 25 Pneumatic Rammers.

PNEUMATIC RAMMER. No. 4B.

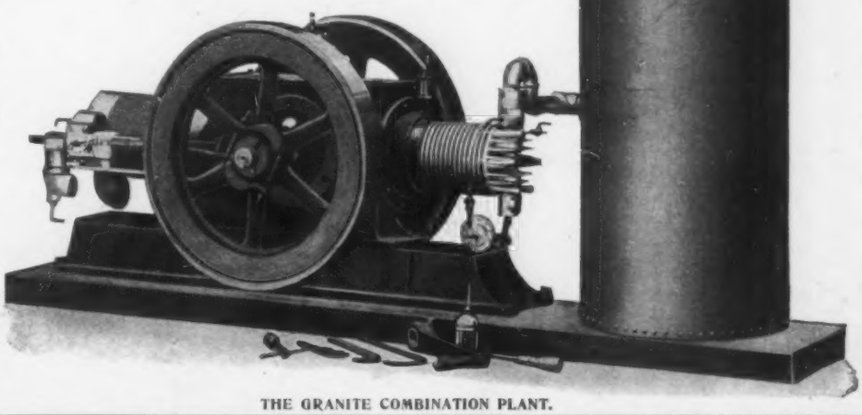
DESCRIPTION OF PLANT

Engine, Bore 6 inches, Stroke 6 inches, 4 H. P.
Compressor, Bore 4½ inches, Stroke 6 inches.
Height, 28 inches.
Length, Engine and Compressor, 4 feet 6 inches.
Length of entire Plant, as shown in cut, 6 feet 6 inches.
Weight, 1,200 pounds.
Shipping Weight, 1,500 pounds.

Capacity, 1 Concrete Rammer.

Write for Estimates on Plants to

FOSTER & HOSLER
415 Wabash Avenue
CHICAGO, ILL., U. S. A.



THE GRANITE COMBINATION PLANT.

At the Buffalo Convention the display of Simpson Porch Column Blocks

and the molds from which they were produced was in many respects the most interesting, as it was in all respects the most beautiful exhibit of cement block work ever seen anywhere.

This sounds like big talk, but any one of the thousands of people who inspected the display will verify this statement. If you were not there, ask your neighbor who was.

We sold on the ground nearly five hundred molds, and our shop, which has been running short time during the recent depression, will have to work overtime to fill these orders, all of which is interesting to the reader only because it shows him thathe will make no mistake in ordering SIMPSON MOLDS FOR ORNAMENTAL CONCRETE WORK, because they are recognized on sight as the most complete, the most simple, the most useful and the most artistic. We want to gve you particulars and prices.

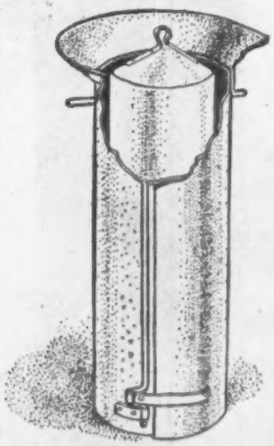
THIS RESIDENCE IS LOCATED AT GARDNER, MASS.

The Simpson Cement Mold Company

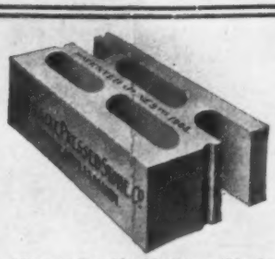
498 N. High Street, :: :: Columbus, Ohio

MIRACLE'S 1908 POLICY

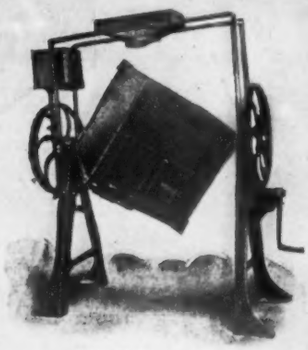
Everything in Concrete Machinery



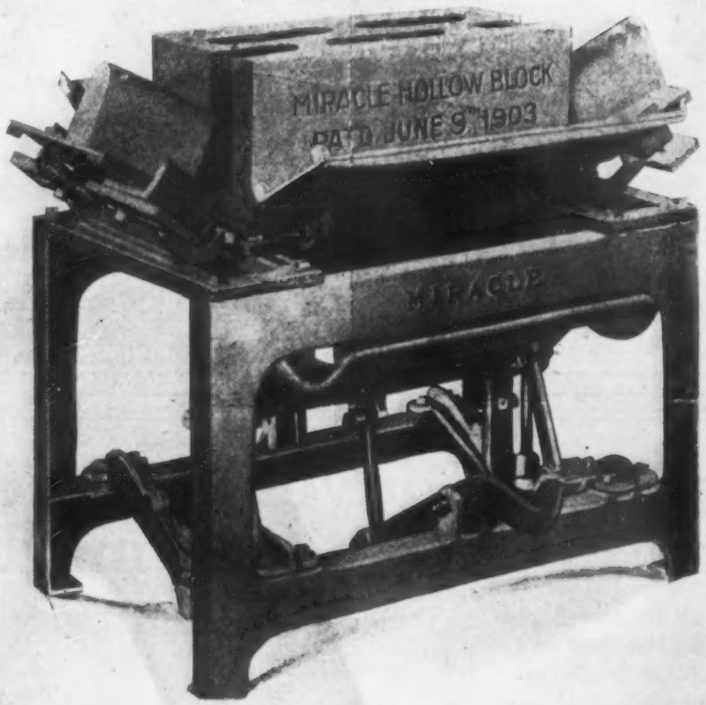
SEWER PIPE MACHINES,
$16 to $50.



Miracle Double Air Space Block



Mixers from $35 up

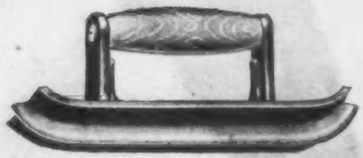


1908 Model Double Air Space Machine,
Price, $275.00

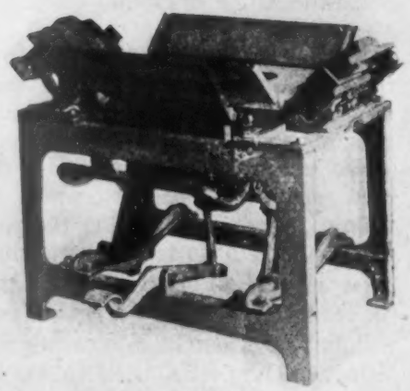
Side Walk Machine
Price, $35.00

Brick Machines
From $5 to $150

Lawn Vase,
$30 Complete



Side Walk Tools, Every Description



Block Machines for $36 to $400

"Ask for Catalogue-Z.

MIRACLE PRESSED STONE CO.,

Largest Manufacturers of Cement Machinery in the World.
MINNEAPOLIS, U. S. A.

THE GENUINE **GANDY**

BELT

is especially suited for cement mills, quarrying, stone-dressing, and all other work where grit, dust and moisture are found. It lasts several times longer than any other; keeps its pliability and tractive power at all times unimpaired; and runs straight and true.

Costs but 1/3 as much as leather

Send for our Booklet
"Experiences with Gandy"

GANDY BELTING CO.
BALTIMORE, MD.

THE GANDY BELTING CO.
BALTIMORE MD.

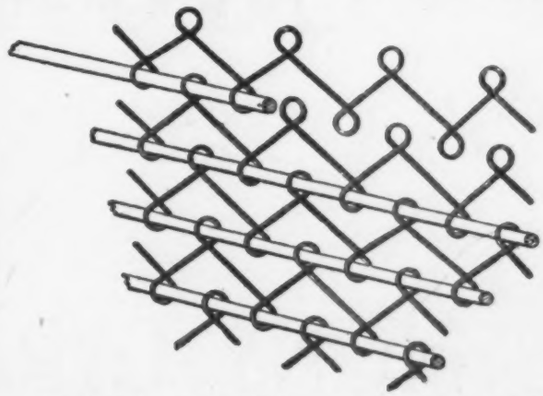
"If it is BAGS We make them"

FOR LIME, CEMENT PLASTER AND FEED

IN VALVE OR OPEN MOUTH

The Urschel-Bates Valve Bag Co.
TOLEDO, OHIO

Mankedick's
Reinforced Concrete Structure



Adaptable to all possible forms of construction, such as Arches, Columns, Silos, Floors or Walls. Uniform strength in every position. Any desired size of rods, wire or mesh may be used that may be necessary for the work required.

Rapid, Cheap and Simple Construction

This Patent is for sale. If not sold soon I will make arrangements to have the material manufactured for the market.

CHAS. MANKEDICK, Patentee,
P. O. Box 397. SULLIVAN, INDIANA

Thomas Block and System of Insulated Walls

A Simple and Correct System of Concrete Construction with Big Profit in it

Not Merely a Cement Block Proposition

A Feature at the Buffalo Show

The Only Block Making Machinery that is Based Upon Scientific Principles and Guarantees Complete Success.

You'll Decide as soon as you investigate.
Write for full particulars.

Every Experienced Sidewalk Man Will Readily See the Advantages and Perfections of the Machinery and Its Products

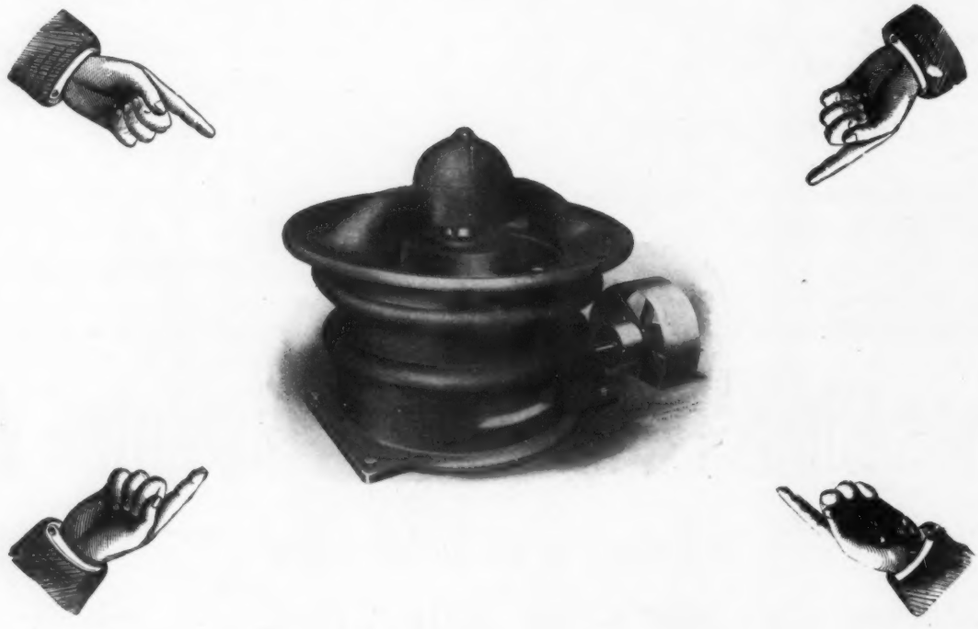
Thomas Cement Construction Company, Joliet, Illinois

Look at it!

SOLD ON GUARANTEE.

THE NEW

SYMONS GYRATORY CRUSHER



HALF THE HEIGHT, size for size, of other Gyratory Crushers.
GREATER CRUSHING AREA, hence GREATER CAPACITY.
NEVER HEATS. USES LESS OIL. WEARS LONGER.

THINK OF IT and Write for Catalogue.

Scores of them are sold every month to users of other gyratory crushers.

Contractors' Supply & Equipment Company

Main Office: 305 Old Colony Building, CHICAGO, ILL.

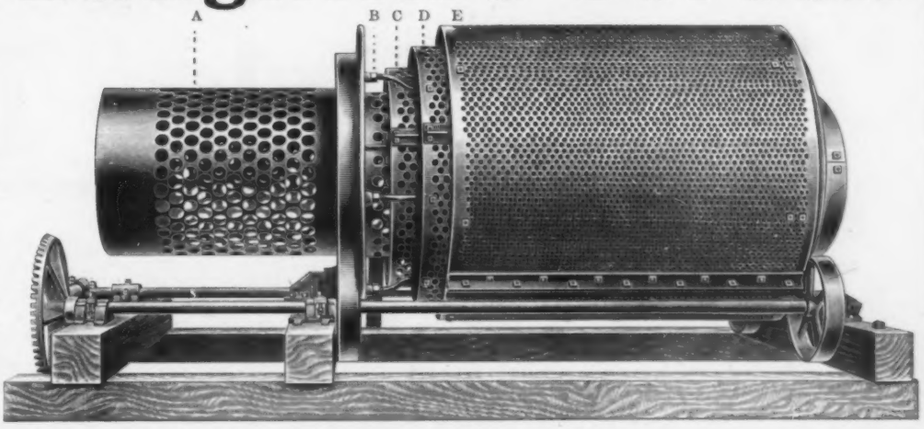
170 Broadway, NEW YORK

John O'Laughlin's Screen

For Granite, Stone, Sand, Gravel, Coal, Coke

Or Anything Requiring Separation

The Separation or Grading of Rock and Other Materials to Positive Sizes Made Easy



THE O'LAUGHLIN SCREEN reverses the older style method of screening by discharging the material to be screened on coarse perforations first, and by this means separates the coarse from the fine material instead of the older style of separating the fine first, and consequently eliminates the wear on each concentric screen to the amount of rejections from that screen. It would be a low estimate to say that the wear on our style of screen is not 1-20 of what it would be on the older style and consequently the power of operating our screen in comparison with screens of the same capacity would be about 1-8. This screen is cradled in trunnions from treads on screen ends which are bound by a steel band 7-8"x 4", bearing on chilled and ground iron trunnions, always a true way of working castings against steel. The inside section unless distinctly specified is not more than 8' in length and consequently the weight of stone in screen is comparatively little. Each concentric screen, as well as center one can be reversed end for end when partly worn and will add greatly to the life of the screen. The screen is complete without sections "A", "C", "D", "E", or either of them, should not that many separations be required, this also adds to or takes from the cost of the screen. When placing an order or making other inquiries, kindly state the number of separations, giving the size of perforations required in inches and fractions of an inch. As we have screens in about every state in the union, should this not appeal after a diligent study, we could refer you to the closest screen in operation to the location of the inquirer. Such a screen as shown in the above cut has been in operation in our limestone plant, Racine, Wis., for four years, where our output was on an average of 150,000 cu. yards, (2,500 lbs. per yd.) annually. It does not tax the capacity of the screen to separate 2,000 cu. yds. daily. The punchings of the screen are as follows:—first the coarse 4", the principle inside screen 2½", second 1½", next ¾" and the next ½". The cost of repairs in separating 600,000 cu. yds. was $90.00, this outlay was for perforations for inside and second concentric screens. This incomparison with the cost of maintaining the older style of screen which I have operated for 22 years and found the cost of maintaining was $300.00 for each 100,000 cu. yds. against $15.00 for an equal amount on this screen. You will find that there are more square feet of screening surface than two of the older style 16'x 40". I will personally guarantee that our screen will do everything that I have said here. I will further state that taking into consideration the perfect separation and the original cost of installing this screen in crushing plants with No. 5 crushers and upwards, this advantage with economy in power will pay for the discarding of the older style and installing our new style screen in about one year. We but ask you to give this a most scientific and critical examination and we earnestly solicit you to call in your most trusted and brightest mechanical engineer. We do not ask you to bar our competitor's best engineers in the manufacture of screens and crushing plants, namely,—at Milwaukee, Wis., Cudahy, Wis., Chicago, Ill., Harvey, Ill., and Columbus, Ohio. Should they or any one prove before three competent engineers, selected in the usual way, that this screen is not constructed on the most scientific plans in every detail of any yet made, and produce the most perfect separation with the power to operate it, they are entitled to and will receive a substantial reward.

EVERY SCREEN IS FULLY GUARANTEED

JOHN O'LAUGHLIN, Racine, Wisconsin

RAW MATERIAL GRINDERS

New Williams Universal

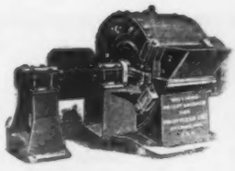
FOR TUBE MILL FEED

800 BARRELS 22 HOURS
95 PER CENT THROUGH 20 MESH
HORSE POWER 40 TO 50

WE ALSO GRIND
GYPSUM, LIME, COAL AND SHALE

Vulcanite Grinder

FOR ROLLER MILL FEED
TAKES MATERIAL FROM GYRATORY, DIRECT



CAPACITY 20 TONS HOUR
FINENESS ½ IN., ¼ IN. AND ⅛ IN.
HORSE POWER 30 TO 35
1,200 MILLS NOW IN USE

WRITE FOR BULLETIN NO. 12

WORKS: ST. LOUIS, MO.

SALES OFFICE: OLD COLONY BLDG. CHICAGO

The Williams Pat. Crusher & Pulverizer Co.

Flint Pebbles and Buhr Stone Linings.

French Buhr Mill Stones, Solids and Built.

J. M. Charles,

Sole Agent.

59 Pearl St., NEW YORK, N. Y

Bolting Cloths, Dufour Swiss Silk, Fine Wire Cloth.

Mixing and Sifting Machinery.

If You Need Gears

and need them quick, write direct to the biggest gear factory in the world. We carry a large stock.

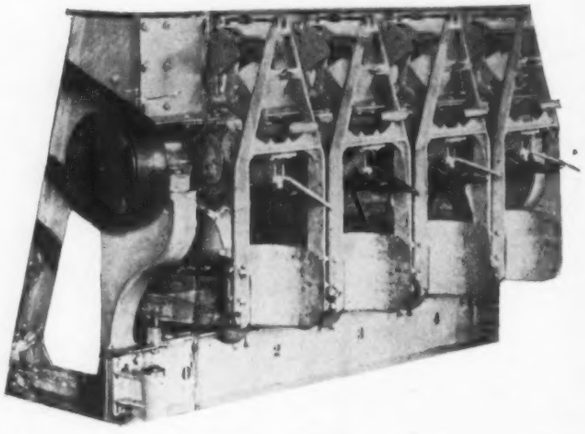
If in a hurry, wire us.

R. D. Nuttall Company

Pittsburg, Pa.

Bates Valve Bags

No tying of paper.
Cotton tied by machinery.
Three men can fill and load in car 800 barrels daily.
Weights best the business has ever known.
Saves thousands of dollars in string and overloading of sacks.
Not half the dust, caused by old methods.

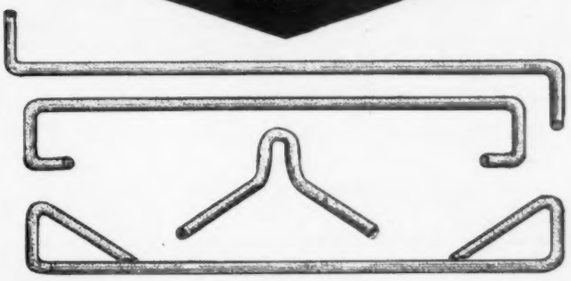


Write for proposition.

Bates Valve Bag Co.

1411 Schofield Bldg., Cleveland, Ohio

IF MADE OF WIRE WE MAKE IT



SPECIAL WIRE SHAPES

Adaptable for Concrete Reinforcing.

A complete line of Anchors, Wall Ties, Rods and Post Staples.

Let us quote prices on your requirements.

Phone 4890 Main

Wire Specialty Company

43 FULTON ST. CHICAGO

Announcement

We herewith beg to inform our customers, and the trade in general, that we have changed our name from the J. R. ALSING COMPANY to the J. R. ALSING ENGINEERING COMPANY, so that our name may show the character of our business, which we found to be necessary.

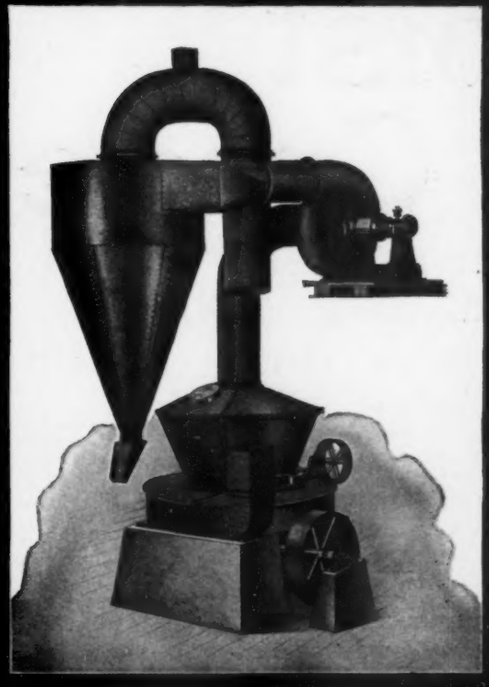
At the same time we increased our capital stock, from twenty thousand dollars ($20,000) to one hundred thousand dollars ($100,000), which was done on account of the enormous increase in our business.

The officers of the new company will be the same as those of the old company.

We beg to thank our friends for the favors, and courtesies shown us in the past, and hope the same will continue under the name of the new company.

J. R. Alsing Engineering Company

136 Liberty Street, New York



Our best customers have frequently been the firms who did not know (before we showed them) that we could help them.

If you grind to powder any material in your factory, we are ready to "show you" what

THE RAYMOND SYSTEM OF AIR SEPARATION

has accomplished for more than 200 firms. As a first step you will certainly find it interesting and profitable to read our booklet

"Making Air Make Money"

This book will give you an idea of what we have been able to do for others, and what we may be able to do for you. We will gladly send you a copy free if you will ask for it.

RAYMOND BROTHERS

Impact Pulverizer Co.

141 LAFLIN STREET :: :: CHICAGO

SIGN THIS COUPON, TEAR OFF AND MAIL

RAYMOND BROTHERS IMPACT PULVERIZER CO.
141 Laflin St., Chicago

Please send your book "Making Air Make Money"

Name _____

Firm _____

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36

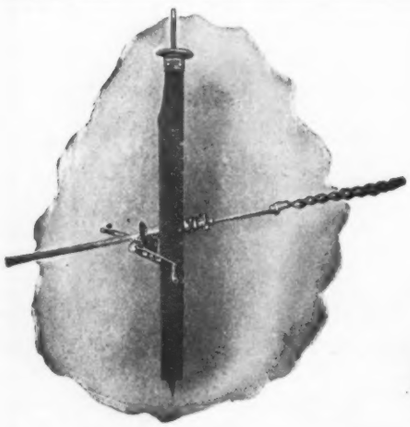
THE FULLER ENGINEERING COMPANY

DESIGNING AND CONSTRUCTING ENGINEERS

Cement Plants a Specialty

REPORTS, EXAMINATIONS AND ANALYSES ON RAW MATERIAL FOR CEMENT

WORKS: FULLERTON, PA. CONSULTATIONS SOLICITED **OFFICES: ALLENTOWN, PA.**



HOWELL'S Celebrated Ball Bearing Heavy Geared Post Drills
for boring anything that an Auger will penetrate.

Awarded Gold Medal, St. Louis.

We make 40 different styles machines run by Hand, Compressed Air and Electricity for boring Fire Clay, Coal, Rock, Rock Salt, Gypsum and Plaster Rock. Send to day for our handsomely Illustrated Catalogue.

HOWELL MINING DRILL CO., Plymouth, Pa. U. S. A.
(ESTABLISHED 1878.)

"Brownhoist" Locomotive Crane

Equipped with clam-shell loading bucket offers the greatest capacity as well as economy for handling sand and gravel in the pit. Crushed stone and screenings loaded and rehandled at minimum cost.

Advance Your Profits by Increasing the Output.

The Brown Hoisting Machinery Co.

CLEVELAND, OHIO

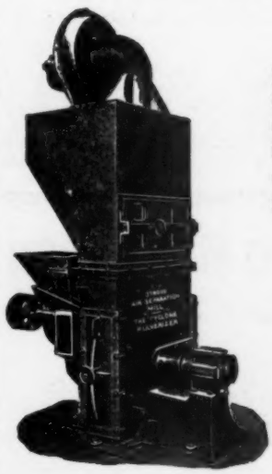
Tell 'em you saw it in ROCK PRODUCTS.

The

STROUD MILLS

OUTDO ALL OTHERS

In quality of grinding and in output per horse-power per hour on most kinds of work, and they grind for less money per ton.



Our Air Separation Pulverizers produce direct from mill, any desired mesh, from say 40x40 down to the most impalpable powders, at will of operator, at a moment's notice. Dustless in operation. Do away with sieving entirely.

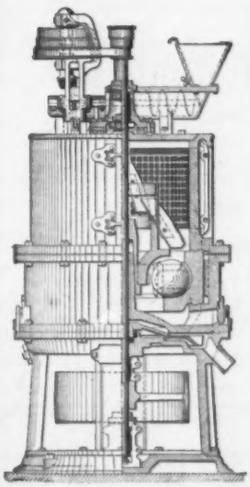
We build Screen Separation Mills too.

Catalogue on request.

E. H. STROUD & CO.

ENGINEERS & MANUFACTURERS

30-36 LaSalle Street. CHICAGO, U. S. A.



Fuller-Lehigh Pulverizer Mill

The Best Pulverizing Mill Manufactured

Exhaustive tests in all departments, in competition with the most approved grinding machines in use, have demonstrated the superiority of our machine.

OUR CLAIMS:

Greater Output
Better Fineness
Fewer Repairs
Dustless

Few extracts from letters received from users

"With the four we are now ordering we will have in use 16 Fuller Mills in all, and I think you can hope to get orders from us within the very near future for quite as many more."

"We have to say for your Fuller Mill that it is unqualifiedly the best grinding device we have ever tried on our lime rock and eminently satisfactory to us."

"We are pulverizing with one Ball Mill and four Fuller Mills sufficient raw material to produce nearly 1200 barrels of clinkers per day, which record I believe can not be approached by any other mill on the market."

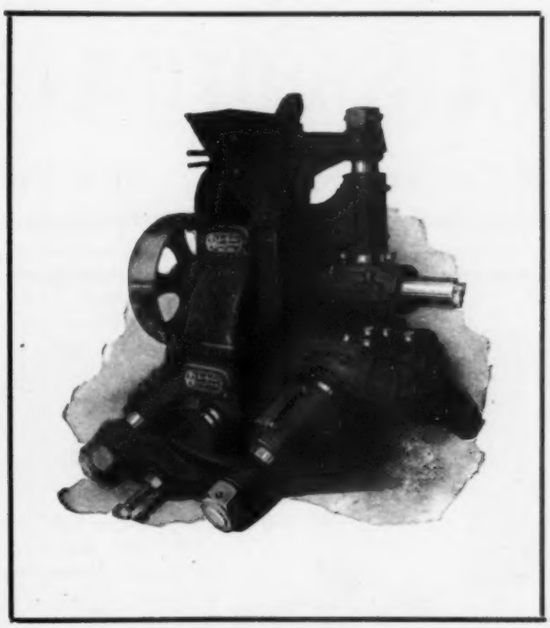
If interested, write us for further information

Lehigh Car, Wheel & Axle Works

Main Office—Catasauqua, Pa., U. S. A.

New York, 111 Broadway Kansas City, Mo., Scarritt Building

THE KENT PULVERIZER



Takes one inch feed. Grinds to any fineness from 10 to 200 mesh.

GRINDS PER HOUR WITH LESS THAN 25 H. P.

CEMENT CLINKER,	40 bbls. to 98%	20 Mesh.	
CEMENT CLINKER,	12 " "	96%	100 "
		83%	200 "
LIMESTONE,	2½ tons to 98%	200 "	
LIME,	4 " " "	100 "	
ROSENDALE CEMENT,	43 bbls. " 90%	50 "	
QUARTZ TRAP-ROCK,	4 tons " "	40 "	

You can easily figure from this what a Kent Mill would save for you.

W. J. BELL, Esq. Supt.
NEWAYGO PORTLAND CEMENT CO.,
Newaygo, Mich.
Says:—Four KENT MILLS are driven by one 75 H. P. motor

For Catalogs and Information, Address

KENT MILL CO.

170 Broadway, NEW YORK.

JOSEPH HICKSON. THAD E. BUCK.

Hickson's Sewer Mold Co.

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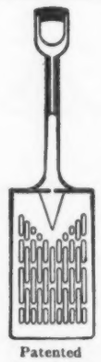
Manufacturers of Steel Molds for Culverts, Sewers, Conduits and Other Hollow Structures.

OUR SPECIALTY: Steel Centers and Forms for Building Culverts and Sewers in Their Permanent Location. Cuts and Printed Matter Sent on Application. (Pat. Sept. 10, 1907.)



Patented Jan. 22, 1907

Spade System for Finishing Concrete Wall

The Vaughan patent concrete spade is used as a finishing tool, by means of which the concrete mass can be separated while in the form, the finer portion being caused to flow toward the side of the form, so as to give a more complete finish to the surface than would otherwise be presented. The spade is perforated so as to give the best possible results.

Write for Prices and Particulars.

Any practical concrete worker can make it pay for itself in a day.

Concrete Spade Mfg. Company
123 South Clinton St. CHICAGO, ILL.

HERE IT IS

The All Steel Wheelbarrow for Feeding

Power Driven Concrete Mixing Machines

Has Not a Single Rival on the Market

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Modern Grinding Machinery

KOMINUTERS for granulating
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Davidsen Tubemill especially adapted for Sand-Lime Brick Work.

Silex Linings for Tubemills
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ENGINEERS

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3000 USERS

...OF...

PARKER

PATENTED
1 and 2 Ton

DERRICKS

And more are being added every week.
Does this remarkable record not mean something?

CATALOGUE FREE
Derricks of all Descriptions

PARKER HOIST & MACHINE CO.
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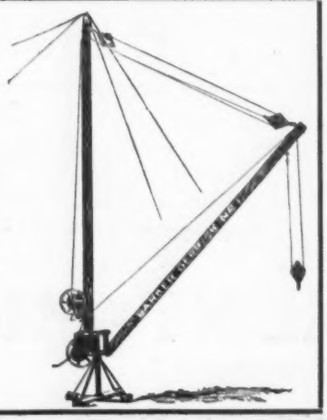

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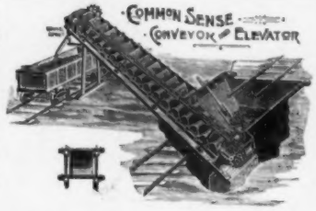

THE GENERAL CRUSHED STONE CO.,
So. Bethlehem, Pennsylvania,

have been using one of our **Common Sense Elevators** for six years—capacity 400 tons an hour.

THE C. O. BARTLETT & SNOW CO. CLEVELAND, OHIO.

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THE

CHICAGO CONCRETE MACHINERY CO.

ANNOUNCE

THAT THEIR NEW GENERAL CATALOG

FOR 1908

IS NOW READY FOR DISTRIBUTION

CONCRETE MIXERS, CONCRETE CONVEYORS

ROCK CRUSHERS, ROAD GRADERS

IRRIGATION GRADERS, DUMP BOXES

WHEELBARROWS, CONCRETE CARTS

MAILED FREE

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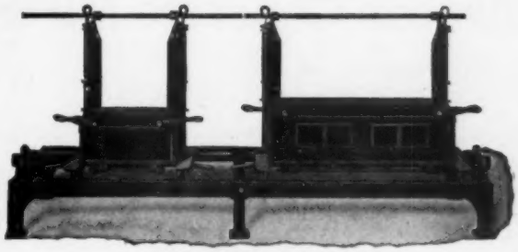

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Face Down—
Wet Mixture

The Hercules

The Fastest, Simplest, Strongest Concrete Block Machine Made

The Hercules is known as the real concrete block maker.

With this simply constructed machine you can make **real** concrete blocks, ranging in size from 2 in. to 6 feet in length. Besides perfect blocks you can make water tables, sills, lintels and steps.

The Hercules is built so strongly and so mechanically perfect that it never gets out of order, and can always be depended upon at critical times to properly perform its duty.

If you haven't seen the Hercules catalog for 1908 you ought to send for one today. We will gladly send it free of all charge—ask for catalog L.

If you attend the Buffalo convention be sure and see the Hercules make stone—real, everlasting stone—the kind that can't be imitated.

Cement Tools

We have just issued a new illustrated catalog and price list of cement users' tools.

We know that it will be to your advantage to get this catalog before you buy elsewhere—ask for Cement Tool Catalog—it's free.

Hercules Concrete Mixer

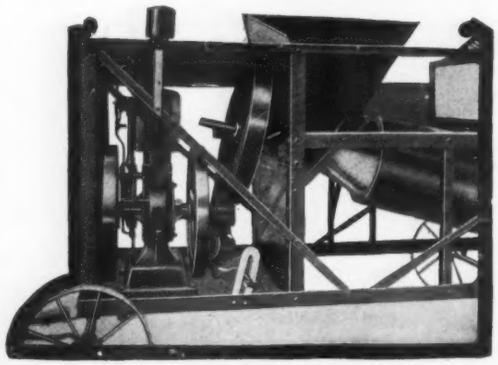
This new mixer will be on exhibition at the Buffalo Convention, Jan. 20 to 25.

It is the simplest and most accurate mixer made—ask us about it.

MADE ON A HERCULES

Century Cement Machine Co.

179 West Main St., Rochester, N. Y.



THE DEMOREST

LITTLE GIANT MIXER

On a 5 mile sewer job the contractors estimated that they could save $2,000.00 in moving expenses alone by using the LITTLE GIANT, besides putting in the work at 50% the cost with any other machine. Isn't it about time you "got wise" and saved some of the good dollars you are paying out. ONLY RESULTS count. CLAIMS of manufacturers amount to nothing.

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BALLOU MFG. CO., 35 High St., Belding, Mich.

Newsom Crushed Stone and Quarry Company,

MANUFACTURERS OF

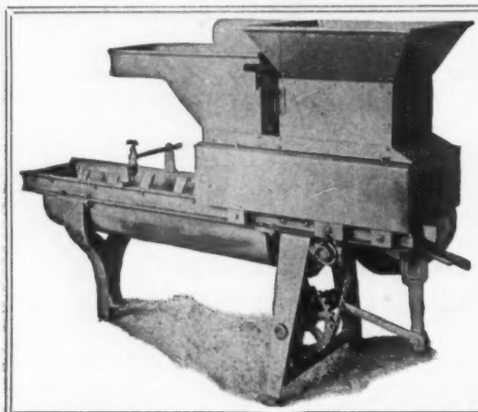
Crushed Stone for Ballast, Concrete Work and Roadways, also Concrete Hollow Building Blocks.

Sales Agents for Cement Block and Brick Machinery, Mixers, Portland Cement, Etc.

NASHVILLE, TENNESSEE.

We have built SEVENTY-FIVE HOUSES out of CEMENT BLOCK with ONE MAKE OF MACHINE, having used it in preference to ALL OTHERS,—knowing from ACTUAL WORK and EXPERIENCE that it is best suited to the work and MAKES EVERY SIZE, SHAPE and STYLE of blocks used in a building.

Write for Particulars of Our Various Lines.



The Kent Continuous Concrete Mixer

"The Mixer that Measures and Mixes"
"You fill the Hopper, the Mixer does the rest."

Continuous, Automatic, Feed Exact Proportions

Materials first Dry Mixed, then "Tempered." Output instantly variable from O to Maximum at will of operator, thus insuring Fresh Material for each Block. Feeds Sand and Gravel Dry or Wet.

Write for description and prices to

The Kent Machine Company, Kent, Ohio

Peerless Brick Machine, 1907 Model.
Pat'd No. 811618.
The people who use the "Peerless" know its profit making qualities.
We will send you a list of the concerns who have already made money by doing business with us, if you wish.

Make Money

As others have already done it, by making Cement Brick upon a Peerless Brick Machine.

The Price is Right. The Brick are Right.

More Peerless Machines now in use producing a profit to the owners than all others combined.

WRITE FOR ILLUSTRATED CATALOGUE.

Peerless Brick Machine Co.,

100 Lumber Exchange, MINNEAPOLIS, MINN.

Tell 'em you saw it in ROCK PRODUCTS.

First Great National Lumber and Building Material

Casino Garden **Exposition** Chicago

One Week, February 10th-15th

Hosts of Attractions for the General Public. Big Crowds will Attend Daily.

Buyers

will be present by the thousands from all parts of the United States.

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will be held in the great Casino Hall by a number of National and State Associations interested in lumber and building materials of all kinds.

Delegates

will attend these conventions from practically every producing State.

ART POSTER, Lithographed in 6 colors. Designed by R. W. Crampton.

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Over 15,000 square feet of floor space will be occupied by exhibits and demonstrations of interest to every manufacturer and dealer.

Displays

of Cement, Sand, Plaster, Gypsum Products, Lime, Tile, Brick, Paints, Glass, Roofing Paper and other Supplies; Machinery, etc. Also Lumber, Sash, Doors, Mouldings, Mantels, Interior Furnishings, Floors, etc.

Don't Wait

Make your reservation without delay. It will be a great show.

Over two-thirds of the Floor Space already contracted for. Make your reservations before it is too late.
For Full Information, Address:

EVERITT W. HOGLE

1205 Hartford Bldg., Chicago, Ill.

X-L-ALL CEMENT CART

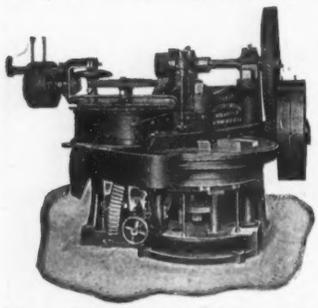
Cement Workers who want increased profits will find this cart the greatest aid. It saves labor and time. It absolutely prevents waste of cement as handled in barrels or sacks.

Buy one and increase your profit.
We manufacture a complete line of cement working machinery. Write for catalog.

BURRELL MFG. CO., 102 Grove St., Bradley, Ills.

The American Sandstone Brick Machinery Company,

SAGINAW, MICH.



Improved Saginaw Rotary Presses are now being built right or left hand, with extra table for making face and fancy brick, on which double pressure is exerted. Our patented brush does the work of one man, and keeps the plunger plates clean.

DON'T confuse our practical system with the so-called Scientific Systems. We confine ourselves to the manufacture of machinery for making brick from sand and lime; installing the complete plant starting and operating at our expense until at least 100,000 brick are made before asking for a settlement.

Our Plants are installed under the supervision of practical engineers who know how Sand-Lime Brick should be made, and can be made.

We have practical plants running successfully, to show to prospective investors.

We are Not Scientists.

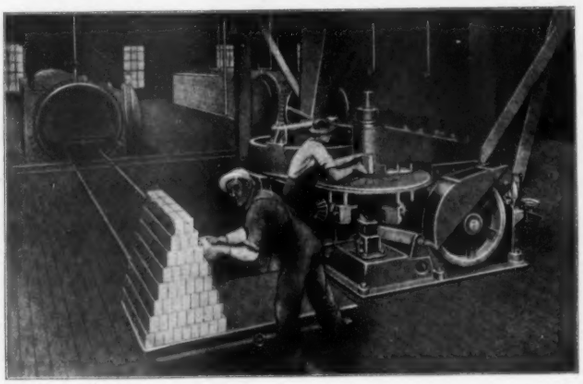
We produce results, because **we are the oldest practical Sand-Lime engineering company doing business in the United States,** and **we defy contradiction.** Incorporated April 1902.

The Cleveland Brick Machinery Co.

Wickliffe, Ohio.

Manufacturers of

Sand Lime Brick Machinery Only



We claim to have the finest Sand Lime Brick Press that has yet been brought out, and we are sure we can convince you if you will see our machinery in operation.

Designers and Builders of Sand Lime Brick Plants.

DON'T LOOK

ANY LONGER FOR AN OPENING TO MAKE MONEY HERE IS YOUR CHANCE. BUY A

SCHENK

CEMENT DRAIN TILE MACHINE

There is more money made making tile with this machine than in any other kind of concrete work. We guarantee it to make from three to five thousand tile in ten hours, with five men and a 10-horse power engine to run it. Remember this is THE ONLY PRACTICAL CEMENT TILE MACHINE ON EARTH. HAVE YOU SEEN IT?

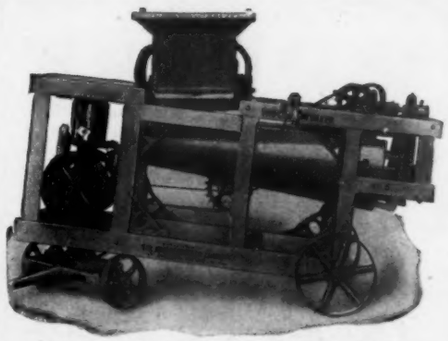
SCHENK TILE MACHINE AND OUR PERFECTION CONCRETE MIXER

This mixer is unexcelled for any class of concrete work. But for brick block and tile it is a mile ahead of them all. Come and see us or write

THE CEMENT TILE MACHINERY CO.

MANUFACTURERS OF CEMENT WORKING MACHINERY

22 Roth Street - - - WATERLOO, IOWA, U. S. A.



THE IMPROVED COLTRIN CONCRETE MIXER

MORE CONCRETE—LESS LABOR

A SKEPTIC CONVINCED

Lansing, Mich., Oct. 10, 1907.

The Knickerbocker Co., Jackson, Mich.

Gentlemen:—The Coltrin Mixer that we bought from you on trial has proven a great success in every way. We find that we can mix a great deal more concrete with less labor with this Mixer than we could by hand, the old way. This machine will more than pay for itself this year.

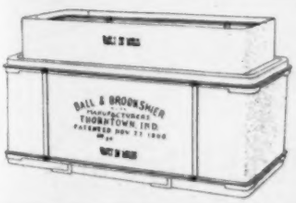
Before your Mr. Westren called on us, we were very skeptical about Mixers, but it did not take us very long to decide after we had put it in operation that it was just the machine we were looking for. This Machine equipped with the 1½ H. P. engine is certainly perfection and it is with pleasure that we recommend your mixer to those contemplating buying a machine. Yours respectfully,

MINNIS & EWER, Per Mr. Ewer.

Investigate for Your Own Satisfaction

Complete literature mailed for the asking

THE KNICKERBOCKER CO., Jackson, Mich.



Hoosier Cement Burial Vault Molds

All steel, no wood to shrink, swell and warp.
Always ready, without repairs, and good for a lifetime.
Best cement proposition known. 500 per cent profits.
Telescopes and adjusts for making SEVEN sizes of cement vaults.
Makes vaults with circle corners, preventing cracks. Corners strongest portion of walls.
For particulars address

BALL & BROOKSHIER, Thorntown, Indiana
Patentees and Manfrs. Ask for Circulars Nos. 9 and 10.

Ask your architect to specify **The Zimmerman Patent Metal Base and Ventilator** to prevent your porch columns and floor from rotting. Send for circular A. Thousands in use.

C. E. Zimmerman, Syracuse, N. Y.

PERFECTION IN BLOCK MAKING

If you wish to attain this you should combine these three important features:

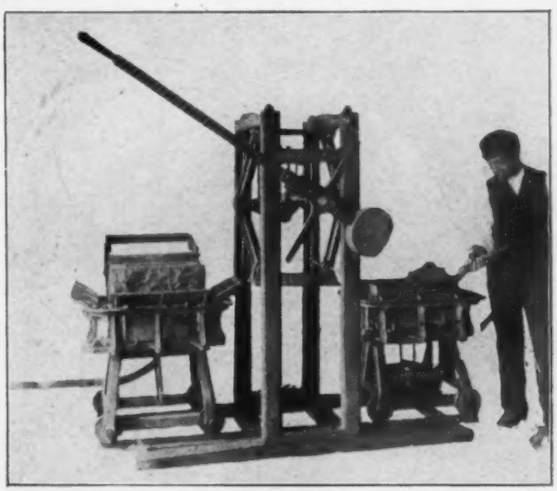
Wet Process Face Down Damp Curing

The **PETTYJOHN INVINCIBLE** Machine does this, and is the only machine that does. Tandem Invincible makes two blocks at once. Price $65.00 and up. Single Invincibles, $35.00 and up. With our **Triple Tier Racking System** green blocks can be stacked three high direct from machine with inexpensive home-made rigging. Plans and blue prints free to customers. It economizes space, reduces off-bearing distance and above all insures slow, even, damp and perfect curing and bleaching.

Write for our latest edition of **"Stone Making,"** a book of valuable data, just off the press—**FREE.**

THE PETTYJOHN COMPANY
614 North Sixth Street Terre Haute, Indiana

Somers' Pressure Block Machine



You are looking for the machine that will make you the most money. Our sales are principally to persons who have started into the business and have learned just enough about the great possibilities of the block business to be convinced that if they can get a machine that is speedy and at the same time one that will make any block the architect may call for, their financial success is assured.

The Somers' Machine will do it. 3 cents saved in labor on every block because of its great speed. Two machines operated successfully under one Press, thereby doubling the capacity. Operated automatically by levers. More moderate in price than the common Hand Tamp outfits. **Write for our Catalogue and prices.**

Somers Bros., Manufacturers

205 North Coler Ave., - Urbana, Ill.

We Will Prove to You

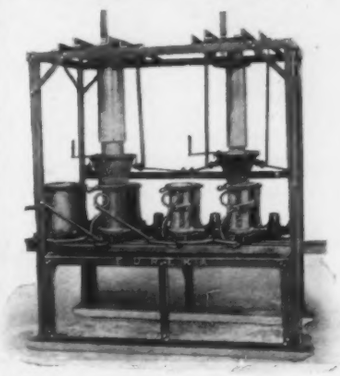
At the Buffalo Convention

that the only perfect and cheap way of making Cement Blocks is by the use of the EUREKA NO. 2 FACE-DOWN MACHINE, because it is the only machine that uses wet material for the body of the block, the only machine that makes a water-proof block that hardens in less time, with less cement than any other.

Eureka Face Down Machine

We Will Also Prove That The

AUTOMATIC TAMPER DRAIN TILE MACHINE



Automatic Tamper Tile Machine

is the only drain tile machine in existence for making drain tile from 2 to 6" very fast in large quantities and at a low cost (3" tile can be made at $8.00 per M).

We will show in Buffalo the most complete perfect working line of concrete machinery ever made. Don't fail to see us there.

If you are not going to be in Buffalo, don't fail to send for our descriptive catalogue, which lists all our machinery and gives many valuable hints to cement workers.

BESSER MFG. CO. Dept. H, 801 Eighth St. ALPENA, MICH.

Tell 'em you saw it in ROCK PRODUCTS.

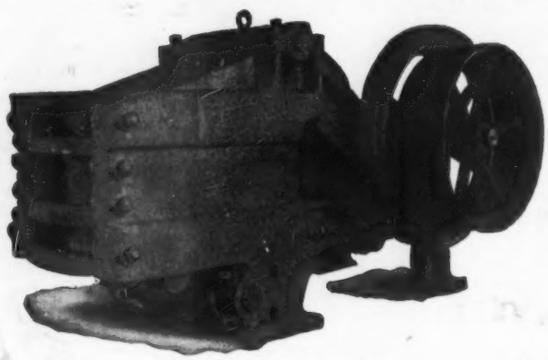
ENTERPRISE PLASTER MIXER

NOISELESS,
DURABLE and EFFICIENT.

For Mixing Hair Fibre, Wood Fibre and Retarder with Dry Plastering Materials.

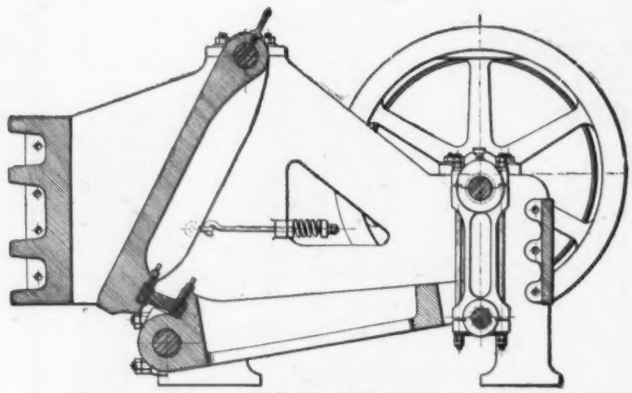
Calcining Kettles

Jaw and Rotary Crushers for Gypsum, Reels, Vibratory Screens, Hair Pickers and Transmission for applying power.



EHRSAM NO. 4 JAW CRUSHER.

This machine will handle large chunks and reduce from 30 to 40 tons of Gypsum per hour to 2½-inch maximum or smaller if wanted.



NO. 4 JAW CRUSHER, SHOWING SECTIONAL VIEW OF NIPPER.
The jaw opening at inlet is 18x28 inches.

The J. B. Ehrsam & Sons Mfg. Co.,

BUILDERS OF

COMPLETE EQUIPMENTS FOR PLASTER MILLS

Enterprise, Kansas

LET OUR POLICY

of manufacturing a uniform and thoroughly reliable stucco

INSURE

you against producing an inferior wall plaster

The Niagara Gypsum Company

MANUFACTURERS OF

ACORN BRAND

- STUCCO
- NEAT CEMENT PLASTER
- WOOD FIBRE WALL PLASTER
- SANDED WALL PLASTER
- FINISHING PLASTER
- PREPARED FINISH
- SUPERFINE PLASTER

Our electrically equipped mines and mills are now in operation with a capacity of 300 tons per day, we assure you of prompt service.

Mines and Mills: Oakfield, N. Y. **General Offices: 597 Michigan St., Buffalo, N. Y.**

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Does Quality Appeal to You?
Does Prompt Service Appeal to You?
Does Reliability Appeal to You?

Then Buy

Your Stucco and Wall Plasters of

The

American Gypsum Co.,

Manufacturers of

High Grade Stucco. "Anchor" Cement Plaster.
"Anchor" Wood Fibre Plaster.
Superfine Calcined Plaster.

General Offices, Garfield Building, CLEVELAND, OHIO.
Mills, Port Clinton, Ohio

QUALITY RELIABILITY STRENGTH QUALITY RELIABILITY STRENGTH

GET THE BEST

Finest Line of Gypsum Machinery

MADE

KETTLE CRUSHER NIPPERS

ASK FOR CATALOG OF

MOGUL NIPPERS. OPEN DOOR POT CRUSHERS

Best Mills in the United States Have Them

DES MOINES MFG. & SUPPLY CO., Des Moines, Iowa, U. S. A.

SPECIAL MACHINERY AND FORMULAS

FOR THE MANUFACTURE OF

WOOD FIBER PLASTER, FIRE PROOFING AND KINDRED PRODUCTS

We furnish the latest improved FIBER MACHINE, (fully patented), also FORMULAS, on a reasonable proposition. The strongest companies and oldest manufacturers are operating under my contracts.

WRITE FOR TERRITORY.

The Ohio Fiber Machinery Co. J. W. VOGLESONG, GENERAL MANAGER. Elyria, Ohio.

Rock Products' Editorial Department
Information Bureau
Eight Traveling Men
Thirty Paid Representatives
At Your Service

Limestone and Shale

FOR MANUFACTURE OF

Portland Cement

ON THE

Illinois Central Railroad

IN THE

WEST AND SOUTH

Coal, Water and Good Labor

For Full Particulars Address

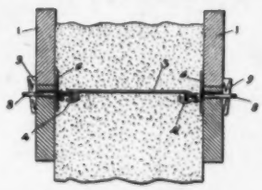
J. C. CLAIR, Industrial Commissioner

I. C. R. R. CO.

No. 1 PARK ROW, CHICAGO

New Type of Wall Form

Investigate this new system; boards held firmly while concrete is being placed; easily and quickly removed; makes wall plumb and uniform in thickness.



SAVES { LUMBER LABOR TIME

Write for circular explaining the system and the appliances:
EXHIBITED AT BUFFALO—BOOTH 159.

Charles Dietrichs, 15 Kaufman Avenue, Little Ferry, New Jersey.

CUMMER CONTINUOUS PROCESS

FOR

CALCINING GYPSUM

NO KETTLES USED

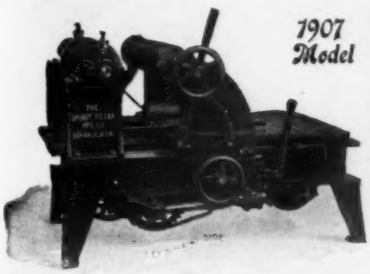
PLANTS IN OPERATION

Great Saving in Cost of Manufacture and Quality of Product Guaranteed.

The F. D. CUMMER & SON CO., Cleveland, O.

Tell 'em you saw it in ROCK PRODUCTS.

The Leonard Wood Fiber Machine



Has an Automatic, Proportional, Increasing Feed, which keeps grade of fiber uniform from start to finish, and holds machine to highest possible rate of production for the grade of fiber and number of saws. Does not begin with fiber and end with dust, nor fall off in rate of production on each log, from 40 to 80 per cent as do the ordinary non-increasing feed machines. Works logs up to 24x24 inches. No royalty string attached to sale. Pay no attention to misrepresentations of our competitors but write for descriptive circular and terms to

The Shuart-Fuller Mfg. Co.
Successors to
The Elyria Machine Works,
Elyria, Ohio

THE SHUART-FULLER MFG. CO., Elyria, Ohio

Gentlemen:—What is the very best, cash-with-order price you will make on anothe Leonard Fiber Machine? We want no other machine but yours. It is all and more than you claimed for it, and is running steady ten hours every day and doing fine work.

Yours truly, GUARANTY WOOD FIBER PLASTER CO., Chattanooga, Tenn

PLYMOUTH CEMENT
AND
WOOD FIBER PLASTER

The Brand that's Made from Pure Gypsum Rock.

WRITE US FOR PRICES AND ADVERTISING MATTER.

Plymouth Gypsum Co.
Fort Dodge, Iowa

The Sheridan Stucco Retarder Co. Toledo, O.

MANUFACTURERS OF

STUCCO RETARDER

Quality, Price, Shipping Facilities, and Prompt Attention, Unexcelled by any. Drop us a line for Prices.

The American Cement Plaster Co.

Make Plaster that Gives Satisfaction.

Try a car and be convinced

We have six mills and can always fill orders

Main Office: Laurance, Kansas.

KING'S WINDSOR CEMENT
FOR PLASTERING WALLS AND CEILINGS

Elastic in its nature, can be applied with 25 per cent. less labor and has 12½ per cent. more covering capacity than any other similar material.

Buffalo Branch: CHAS. C. CALKINS, Manager
322 W. Genesee Street

J. B. KING & CO., No. 1 Broadway, New York

STUCCO—Lycoming Calcining Company

Garbutt, Monroe County, N. Y.

Enlarged, Re-equipped, Better and Larger than ever. Capacity, 250 tons per day. First Stucco mill built at Garbutt. Now located on two R. R. systems. Shipping facilities unsurpassed. Ten wall plaster Companies now using our Stucco exclusively, under contract. Write for price.

MAIN OFFICE, - - - - WILLIAMSPORT, PENNA.

Empire Gypsum Co.

The Empire Gypsum Company's new mill, with capacity of 200 tons daily, is in operation and they are prepared to promptly furnish the best quality of Empire Stucco, Empire Neat Plaster, Sterling Wood Fiber Wall Plaster and Excelsior Wall Plaster Sanded.

Garbutt, Monroe County, New York.

GET THE BEST

Finest Line of Gypsum Machinery

MADE

KETTLE CRUSHER NIPPERS

ASK FOR CATALOG OF

MOGUL NIPPERS. OPEN DOOR POT CRUSHERS

Best Mills in the United States Have Them

DES MOINES MFG. & SUPPLY CO., Des Moines, Iowa, U. S. A.

SPECIAL MACHINERY AND FORMULAS

FOR THE MANUFACTURE OF

WOOD FIBER PLASTER, FIRE PROOFING AND KINDRED PRODUCTS

We furnish the latest improved FIBER MACHINE, (fully patented), also FORMULAS, on a reasonable proposition. The strongest companies and oldest manufacturers are operating under my contracts. WRITE FOR TERRITORY.

The Ohio Fiber Machinery Co. J. W. VOGLESONG, GENERAL MANAGER. Elyria, Ohio.

Rock Products' Editorial Department
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New Type of Wall Form

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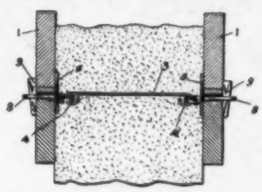
SAVES { LUMBER LABOR TIME



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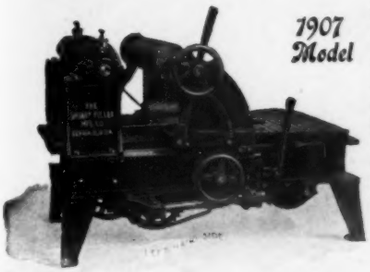

1907 Model

Has an Automatic, Proportional, Increasing Feed, which keeps grade of fiber uniform from start to finish, and holds machine to highest possible rate of production for the grade of fiber and number of saws. Does not begin with fiber and end with dust, nor fall off in rate of production on each log, from 40 to 80 per cent as do the ordinary non-increasing feed machines. Works logs up to 24x24 inches. No royalty string attached to sale. Pay no attention to misrepresentations of our competitors but write for descriptive circular and terms to

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The Brand that's Made from Pure Gypsum Rock.

WRITE US FOR PRICES AND ADVERTISING MATTER.

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Quality, Price, Shipping Facilities, and Prompt Attention, Unexcelled by any. Drop us a line for Prices.

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Main Office: Laurance, Kansas.

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STUCCO—Lycoming Calcining Company

Garbutt, Monroe County, N. Y.

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MAIN OFFICE, - - - - WILLIAMSPORT, PENNA.

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Garbutt, Monroe County, New York.

Tell 'em you saw it in ROCK PRODUCTS.

in the Lime Light "Universal"

In the "lime" light of experience—i. e.—in the light of **lime** experience, the careful builder of the present will eschew all suggestion of familiar lime troubles by building his plastered walls with modern hard plasters and particularly by **finishing** with

UNIVERSAL
The Finish Without Lime

No plastered wall is as good as it might be, which is not builded with U. S. G. Hard Plasters **and finished with "Universal."**

No Architect who desires to maintain a distinguished place and prestige in his profession, can afford to neglect specifying "Universal" for the final plaster coat—particularly in the better class of residences and buildings.

No Contractor who values the **net economy** of a good job well done, can afford to disregard the specification of "Universal."

No Builder who wants things right, will jeopardize the life and beauty of his expensive mural decorations, by not insisting on an "Universal" finish—when he knows about it, and the majority of good builders do.

No Material Dealer Can Afford

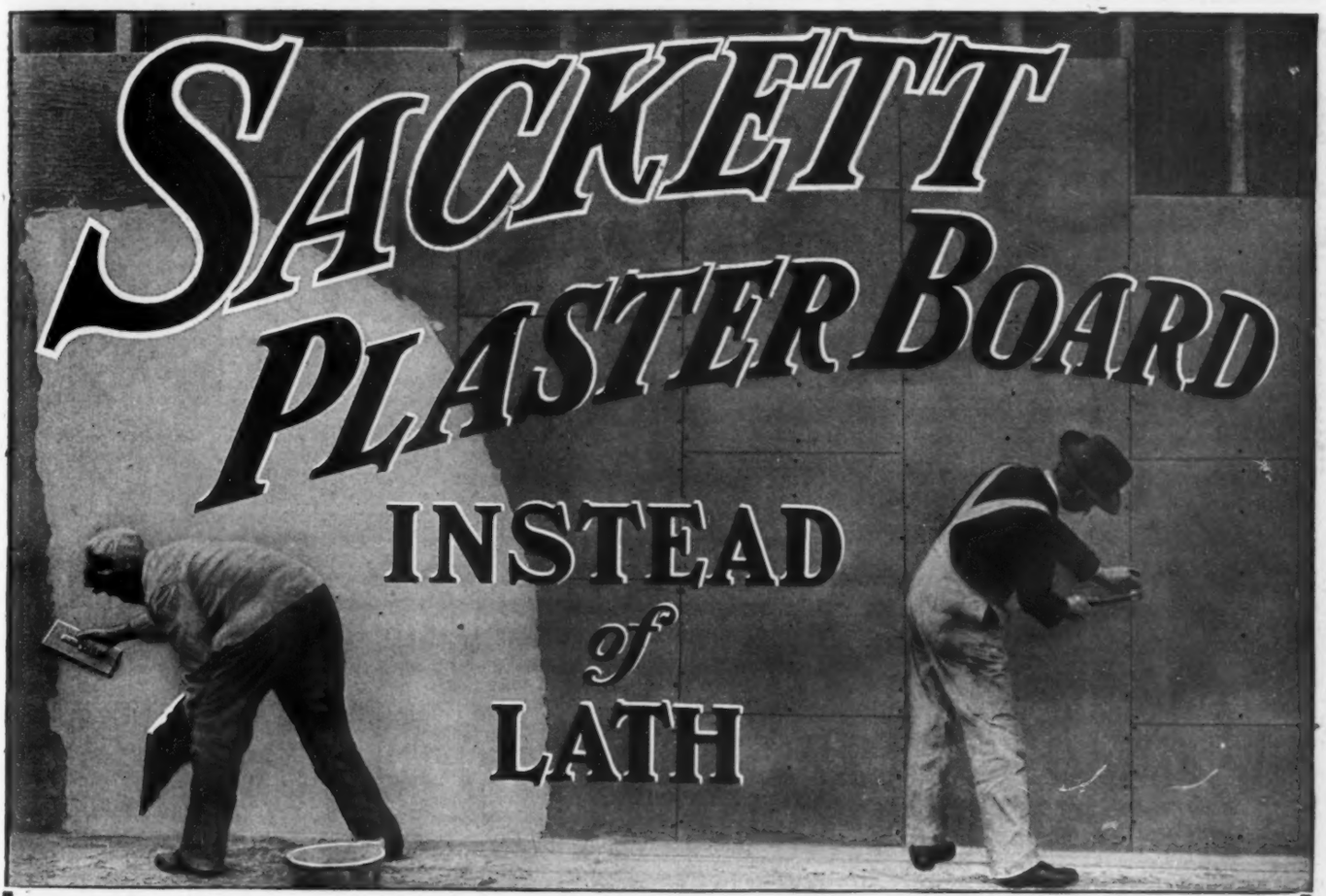
not to carry and actively push "Universal"—if he be building his business for the future—if he value the reputation of being modern and alert—if he desire to hold old customers and **create new business with new commodities**—if he desire to **eliminate stock shrinkage** and **make more money with less labor and expense** on finishing materials.

We Help The Dealer Sell "Universal"

by supplying him generously with the snappiest, brightest kind of instructive and convincing Advertising Matter—a class of Advertising Literature such as will do him credit, when put into the hands of the most select home owners, bearing his own advertisement.

For instance—Write us Today for copy of the little "Universal" Booklet, "Here's Your Finish." Do this—it's good money in your pocket. Address our nearest office.

United States Gypsum Company
Chicago Cleveland Minneapolis



FIREPROOF AND ECONOMICAL

SACKETT PLASTER BOARDS have been successfully used since 1891 in thousands of buildings of all classes, including small cottages, prominent hotels, costly residences, churches and theaters.

Walls and ceilings of Sackett Plaster Boards will be **DRY AND READY IN HALF THE TIME** required when lath is used, as less than half the quantity of water is needed.

Less moisture means **less damage** from warped and twisted trim and woodwork.

Their superior insulating qualities make warmer houses with less fuel. The first cost is **no more** than good work on wood lath, and **less** than on metal lath.

Sackett Plaster Board is an efficient and economical FIREPROOFING not only for walls but between floors, and for protecting exposed wooden surfaces in mills, warehouses and industrial structures. It is also used extensively instead of lumber as outside sheathing under weather boards.

Sackett Plaster Board comes in sheets or slabs 32x36 inches ready to be nailed direct to the studding, furring or beams.

For all kinds of Buildings its use is ideal. It speeds construction; it lessens building cost; it reduces fixed charges for insurance; it makes fire resisting walls and ceilings, and gives absolute satisfaction.

Carried in stock by **up-to-date building material dealers** everywhere.

Booklet showing buildings all over the country where these boards have been successfully used with SAMPLES and name of nearest dealer furnished on application to any of the following General Distributors.

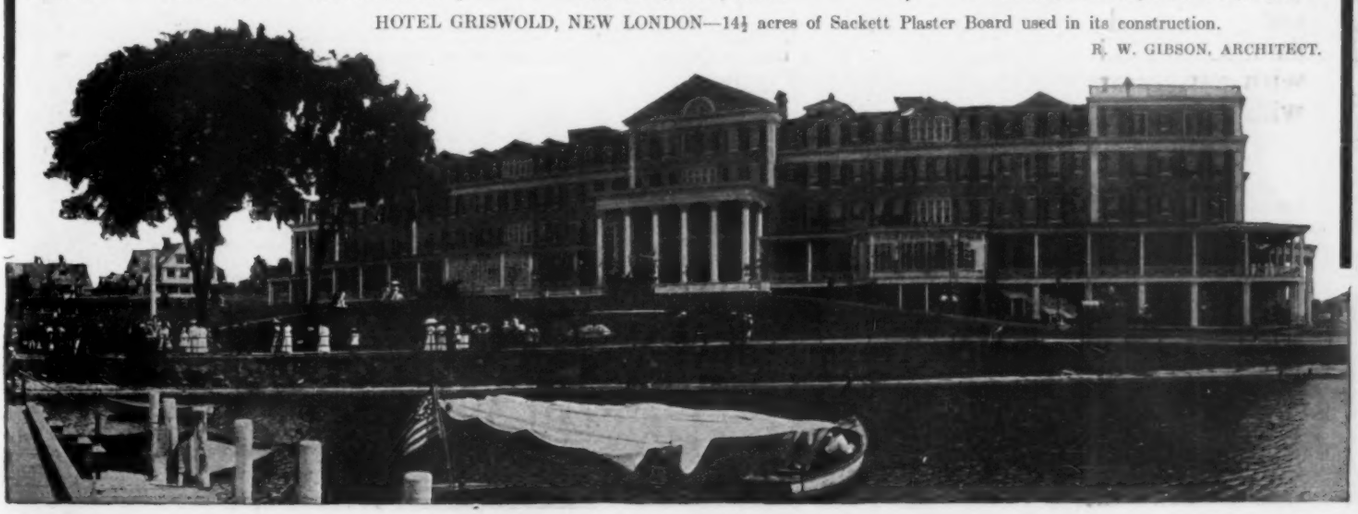
UNITED STATES GYPSUM CO.
CHICAGO CLEVELAND MINNEAPOLIS

GRAND RAPIDS PLASTER CO.
GRAND RAPIDS, MICH.

SACKETT PLASTER BOARD CO.
17 BATTERY PLACE, NEW YORK CITY

HOTEL GRISWOLD, NEW LONDON—14½ acres of Sackett Plaster Board used in its construction.

R. W. GIBSON, ARCHITECT.



Sand-Lime Brick Hardening Cylinders

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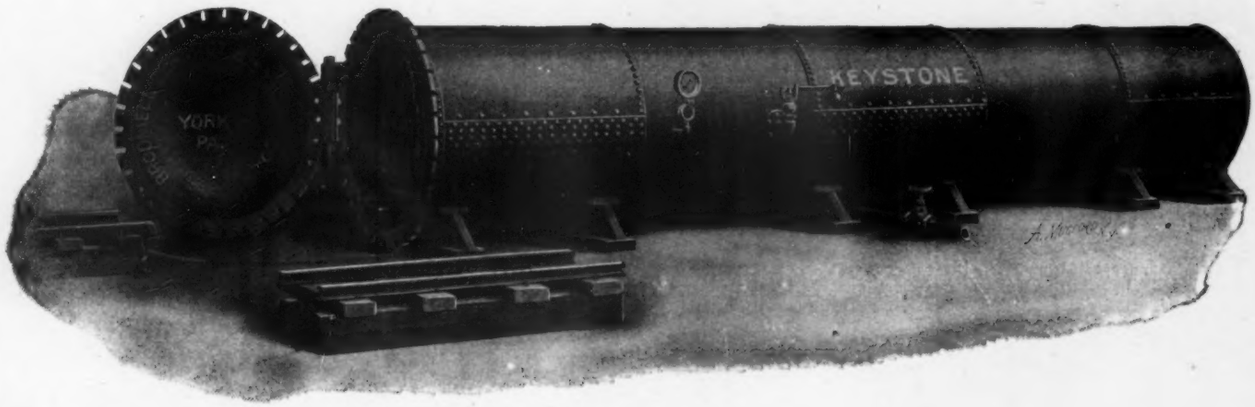

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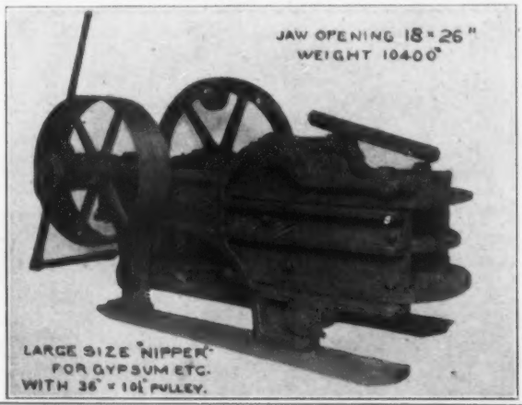

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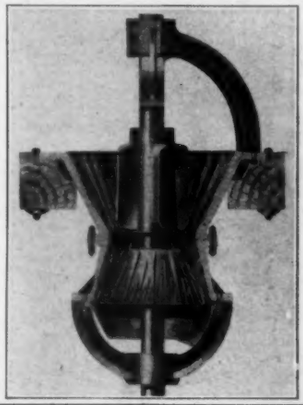

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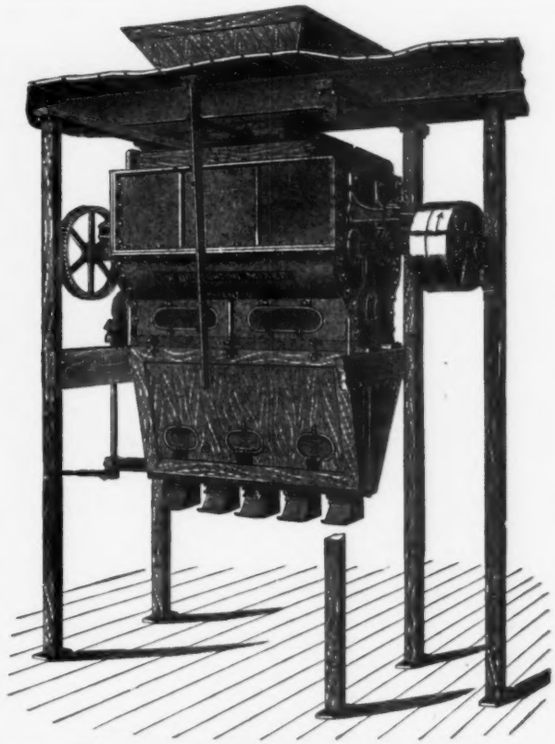

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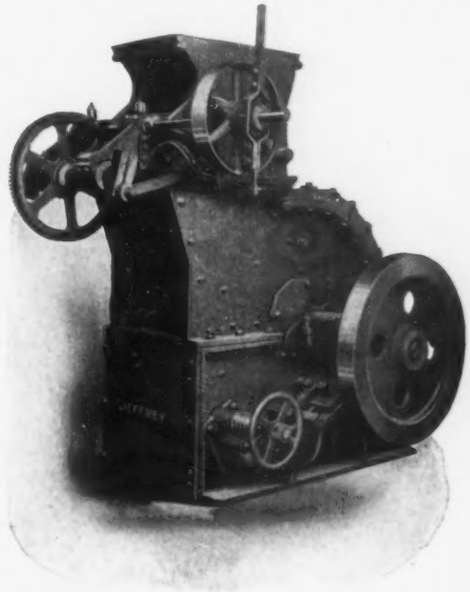

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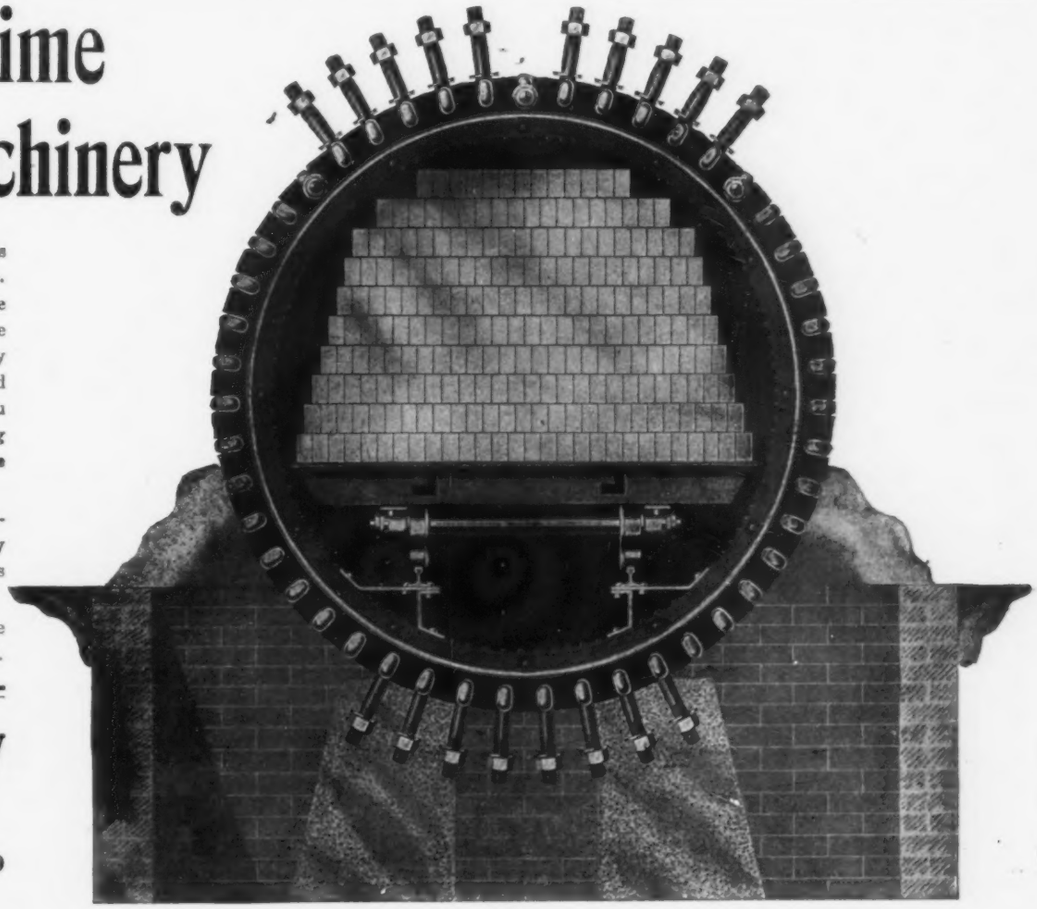

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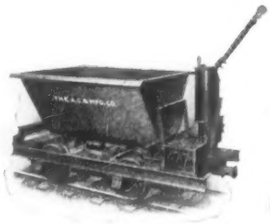

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